THE

SOUTHERN AGRICULTURIST.

OCTOBER, 1834.

PART I.

ORIGINAL COMMUNICATIONS.

ART. LIII.—*Anniversary Address, delivered before the Agricultural Society of South-Carolina, August* 19, 1834; *by* ROBERT W. ROPER, Esq.

A NOVITIATE in Agricultural Science ventures to engage your attention upon the present occasion. Whether prompted to this attempt by vanity, or impelled by ambition, some indulgence is due to an adventurer, who could presume to point your thoughts to the mysteries of Science, to lead you among the fields of Nature, and bid you mark the glories of Creation. More profitable would it prove for me to listen to lessons of experience from your lips, and learn from age and observation, the results of wisdom and experiment. But, at your call, I enter on my probation, and though with feeble effort, shall yet attempt to sketch some prominent features in this extended sphere, where all that is lovely, useful and commanding, constitutes the prospect and invites the philosophic mind to contemplate their origin and end.

In the varieties of climate and of soil which diversify the earth, Providence has wonderfully adapted her gifts to the necessities of life. Except in the gratification of artificial wants she has left little for art or intelligence to accomplish, and scarcely sufficient to awaken sagacity or stimulate experiment. The brute creation without toil or

solicitude have food provided; and feathered tribes of air know where their wants can be supplied. In the frigid regions of the North, where genial warmth so seldom and so briefly cheer the trembling inhabitant, the approach of famished winter is early perceived by animal instinct, and migrating droves and birds on sounding pinions seeks in more hospitable climes, the bounties provided for them. The finny tribes imbibe their lesson, and roam from ocean to ocean as changes of seasons, and of temperature invite to accustomed haunts and a congenial climate. Under the burning Zone, the same parental care is equally exhibited among other classes of organized existence, and animals and insects are gifted with structures and habits adapted to peculiar location, nor cry in vain for supplie to their especial wants. To man, also, the bounties presented by nature, are luxuriantly profuse, earth and ocean are his tributaries, and independent of the aid of culture, the savage in due season procures his meats and fruits, and acknowledges the Great Spirit as his provider. A glance at the proffered store will display this extended beneficence.

In the Islands of the Pacific, the *Artacarpus inscisa*, (or Bread-fruit tree) supplies food to a listless and ignorant population for eight months of the year, besides contributing from its other qualities towards a supply of clothing, and various necessaries of life, and this tree is the spontaneous product of the forest. In other climes, the Banana and Plantain form another species of luscious nourishment. In South-America, the Potato grows wild, and Maize, supposed to be indigenous to America, flourishes in a wider range of climate, than any other grain, and yields in some countries two crops in a season. The *Palo de Vaca* blooms in Cumana, from whose copious veins is discharged a milky fluid partaking of all the qualities of that drawn from animal sources; cream and butter are manufactured from it; and the milk, exuding from the recent wound, is delicious to the taste, and refreshes the exhausted system. In the Island of Cuba, where, for months, rain seldom waters the parched earth, vines are abundant in the forest, which climb and entwine around the extended limbs of trees, and thence descending, coil upon the ground, which, when cut, distil a refreshing fluid to the thirsty traveller.

I might continue to enumerate other spontaneous supplies conferred on man, but my purpose conducts to a nobler object. I would invite you to the field of the husbandman smiling with life and loveliness, and bid you contrast these gifts extended and perfected by culture—would bid you contemplate the results of intellect and industry, detecting the mysteries of Agriculture, and developing a Science which leads to golden prospects, where disappointment is never succeeded by despair, but as hope points into futurity we eagerly advance with expectation of a happy fruition. I would present to your notice a Science which discloses the secret of increasing and perfecting what was comparatively limited; and extends advantages conferred on man to those over whom he has received dominion—a Science, which in its practice enobles the mind, invigorates the body, and by the enlargement of individual interest secures the acquisition of social happiness—a Science which creates nations, forms the basis of good government, and contributes to secure national independence.

It is unnecessary to sketch minutely the rise and progress of Agriculture. Suffice it to say, it was the primitive avocation of man, who was placed in a garden, and after all his judgments, had still reserved to him the blessings of Agriculture. Cain tilled the earth; Noah planted a vineyard, and the Patriarchs offered to heaven first fruits of the increase of their flocks and herds. The Egyptians favoured by a fertile soil and genial climate, furnished a granary for surrounding tribes, and were instruments in preserving from famine the chosen people of God. Indeed, in this country, the art of cultivating the earth was held of such importance, that its inhabitants impiously elevated to divine worship, the ox, the patient labourer of the Husbandman. The Chaldeans, Phœnecians, and Greeks, held Husbandry in high estimation, and the Romans venerated the plough. To the Romans, mankind are more indebted for improvements in Agriculture than to any other nation of antiquity; their poets and philosophers celebrated the pursuits of rural life, and in the purer ages of the commonwealth, their most illustrious citizens and successful generals, personally laboured on their own estates. During the middle ages, this peaceful avocation remained much neglected, when the Flemish revived the fad-

ing Science, which glimmered on until the reign of Henry VIII. of England, when a treatise on Husbandry was published by Sir A. Fitzherbert. Gradually has it been advancing from that period until within the last century, when the greatest progress has been made in this branch of knowledge, and commensurate with improvements in other Sciences; for the correct knowledge of Geology, Mineralogy, Chemistry, Botany, and Vegetable Physiology have given the command of important agents, elements and principles of which, till lately, there has been a very superficial knowledge. At this period, then, is possessed greater facilities for agricultural improvements then were ever enjoyed by those who have preceded us, and instead of groping and chimerical experiments, the moderns advance with precision towards the object to be obtained. In England, it has become the practice of a farmer before commencing the cultivation of his farm, to submit to chemical analysis, the different qualities of soil, and be regulated in his mode of culture and appication of manures by the result of the tests applied; and so common has this custom become, that in Edinburgh, several chemists have devoted their time exclusively to this avocation, and acquired therefrom independent fortunes.

These facts suggest the inquiry, in what does vegetable life consist? The careless observer may view with indifference the hue of the flower, or survey with listlessness the expanded glories of the forest. Carpeted fields may be spread in vain for him, and clustering vines and matured fruits present their treasures to a cold and thoughtless hand. But the eye of the philosopher detects more in these operations than mere chance—sees more intended than to gratify the eye and sense, and at once investigates by what laws these realities are invigorated and sustained. He contemplates the tender flower just bursting into birth, with its fresh pale cast of infancy, acquiring day by day growth and colour, expanding its leaves, and stretching to the light and air its supplicating branches, and concludes that some peculiar structure must adapt it to receive its sources of supply. He penetrates the subterranean situation of the seed, and detects at once an alteration. Minute vessels, invisible to the naked eye, have expanded; the integument is broken—the vital principle stimulated, and a root began to shoot downwards, from whose stem,

slender fibres wander forth, to seek assistance for the parent plant. A store-house is now formed at the root, by the conversion of a dry and tasteless part of the seed, into a saccharine fluid, called by botanists, *albumen*, which becomes united with another part called *cotyledons*, whose office is to propel their fluids into the embryo, and assist germination, or raising themselves out of the ground, in the form of seminal leaves, perform for a time the functions of those which are real.

Chemistry assists observation and illustrates the causes of these changes. The first agent detected is moisture, which, stimulating the latent principles of vegetation, sets in action the wonderful process. The root obeying the laws of gravitation, shoot downward, and the stem, attracted by atmosphere, ascends in size and strength, and forms a channel of communication to other parts of the plant. By the medium of water juices of the soil are conveyed to the root, and organs of vegetation absorb and conduct them to the stem, and thus sap, the blood of the plant, is produced. The wood is gradually formed from the *liber* or innermost part of the bark, and consists of concentric layers of innumerable fibres, all running longitudionally, through which sap, air, or peculiar juices flow, and are forced to immence altitudes by the agency of heat, by electricity, by the irritable nature of plants, and by the effect of agitation afforded by winds. Dr. Hales has determined this force in certain seasons of the year as capable of supporting a pressure equal to two atmospheres and a half, and five times that by which the blood is propelled in the crural artery of the horse.

A principal agent affecting plants is the soil in which they vegetate. Seeds will germinate in sponges, tow, cotton, &c., and marine plants in water, but in these mediums, vegetation never reaches perfection unless with weak and delicate plants. All soils contain, in various degrees of intermixture, nearly the same ingredients, consisting of some of the primitive earths, animal and vegetable matter in a decomposing state, certain saline compounds, and the oxyd of iron. A botanic garden will show, from the various species of plants flourishing in it, how abundantly these principles enter into every vegetable, though the chemical and physical agents of nature affecting them, produce results of vast variety and importance.

A necessary and inseparable connexion between soils and their products, do not exist, though from particular confirmation, soils are adapted to certain plants, as the pine flourishes most luxuriantly on arid spots, and the hickory denotes the fertility of that which cherishes it. Plants do sometimes absorb matters extraneous to their composition, and such substances may form prominent constituents of the soil; hard woods are said to contain the oxyd of iron, from which mineral, the oak derives one-twelfth of its weight, and metallic grains have been found in strawberries. Sulphur and phosphorus also are met with in plants, and many of the earths discovered in ashes. But the value of soils is affected by other considerations, as by weight, the lighter sort being generally impregnated by greater quantities of animal and vegetable matter. By thickness and depth of the subsoil, on which it rests; whether this bottom be dry and gravelly, or wet, cold, and hard. By its capacity for imbibing and retaining the principles of heat, depending much upon colour; black soils acquiring a higher temperature than those which are pale coloured. And by the quantity of moisture, and particular manner in which it is distributed throughout the materials of the soil.

The more minutely a soil is divided, the greater is its capacity for absorption, which enables the various substances composing it to exert, in the ratio of their peculiar capacities, an attraction for such arieform fluids as each may have an affinity. Thus, by ploughing, the earth is rendered friable, and the matter exposed that tends to deoxidate the air, which, increasing the absorption of oxygen by the soil, augments its vegetative powers, and as often as the surface is renewed, produces similar consequences. In long drought this plan has frequently been resorted to with success. But constant repetition of this process creates exhaustion of the soil, and the application of stimulants is absolutely necessary towards an increased product. Nature, in her admirable economy, happily furnishes an abundant store for this purpose, and has so arranged the system, that the residuum, from the supplies of her creatures, becomes converted into means for renewed production.

In the composition of manures, we find incorporated the first principles necessary to vegetable life—hydrogen

abounds, carbon exhibits itself by the black colour manure assumes when well rotted, and carbonic acid gas is perpetually escaping. One of the most useful and fecundating properties of manure is oxygen, which is drawn from atmospheric air, and transmitted to the absorbent vessels of plants; and from carbonic acid gas, carbon is resolved into the constituent of wood, while the aqueous particles are evolved. This substance forms the basis of all vegetables, from the flower of the field, to the solid oak, and of all oils, gums, wax and resins.

Experience has demonstrated, that vegetable substances absorb more than animal, and these more than earths. All substances that undergo decomposition answer for manure, but such are to be preferred whose gaseous principles are most easily and abundantly evolved. Cotton-seed is one of these, it opens the earth, and supplies to the soil and roots of plants a vast quantity of carbonic acid gas and hydrogen. Ashes, another powerful manure, contains a residuum of earths equal to one-fiftieth part of the vegetables consumed. Salt is extolled from its fertilizing quality, but what proportions prove most beneficial, experience has not established. Large applications of this material has been said to have rescued barren spots from sterility; in such instances, perhaps, its pungent qualities may have acted chemically on deliterious matter hostile to vegetation, and brought the genial properties of the soil into full developement, but, that uncombined, it promotes fertility, is not demonstrable. I would refer any skeptic on this point to the appearance of a rice-field after one flowing with salt water; to the effects on a garden irregated with brackish water; or to the seashore, where no vegetable matter is ever nourished by the glistening particles. Marsh-mud has received especial notice as a powerful restorer, and its great utility attributed to the presence of salt, when other combinations unite to impart a value. The soil on which mud proves most beneficial, is of an open sandy formation, liable to be much deteriorated by an ardent sun: when in such land a quantity of mud is incorporated, the pores are partially closed, excessive evaporation prevented, and the salt exerting a strong affinity for water, extracts from the atmosphere, and retains a supply of moisture for the plant. Hence, marsh-mud, has, by an intelligent writer on the

subject, been said to withstand the injurious consequences of drought, and been called a cold manure, and better fitted for high than low-lands. But mud without salt will likewise produce results highly benefical to vegetation, as the luxuriance of fresh water mill-ponds, from deposited sediment, will prove, or that derived from the slime of the waters of the Nile or the Ganges.

A rotation of crops is highly instrumental in increasing the product of soils. The vegetable structure, like the animal, is equally subject to the influence of poisons, and nearly all that affect the one, will operate upon the other. Corrosive poisons destroy the tissue on which they act, narcotic poisons destroy vitality without producing any decided alteration on the tissue: and in the action of vegetable poisons, a plant may be killed by that it has itself secreted. From the root of plants a superfluous fluid exudes, which mixes with the earth and produces a deliterious influence on the sap, rendering it more or less noxious to the growth of the same, or allied species of plants, though congenial to the support of others of a different species. Good tillage teaches not only when and how to plant, but how to take advantage of these facts, in planting such a rotation of crops, as will receive advantage from this stimulating property left in the soil by the root of the precedent grain. De Candole, an eminent French writer, after enumerating some collateral circumstances, which should direct the judgment of cultivators in selecting such plants as may be best adapted to a rotation of crops, proposes the following physiological principles to ensure complete success. "First, a new crop ought never to succeed another of the same kind, unless under very peculiar circumstances, as when the soil is annually renewed, or where it is naturally so fertile, as to be capable of resisting the inconveniences which ordinarily result from such a system. Secondly, a new crop ought not to succeed another which has been raised from plants of the same family. Thirdly, all plants with acrid and milky juices, injure the quality of the soil, and their remains should never be buried after the removal of a crop. Fourthly, plants with sweet and mucilaginous juices, improve the soil for others of a different family, the chief of these are the leguminose, which are commonly adopted in practice for this purpose."

These peculiarities in the vegetable constitution conduct to other inquiries, particularly that of an adaptation of plants for change of climate. Botanists have been attentive to this subject, and attempted various experiments to attain success. The Marquis de Nava, originated the idea of forming the botanic garden at Durasno, in the Island of Teneriffe, as the most suitable place for naturalizing plants from the East-Indies, previous to their introduction into Europe, and there is abundant proof, that from low to very high latitudes, plants can be transferred and naturalized with success. Sir Joseph Banks, says, "By repeatedly raising plants from seeds grown upon the spot, he has so naturalized vegetables that were natives of a warm climate, and which on their introduction into this country, could only be kept alive in conservatories, that they are now enabled to flourish in the open air, without artificial protection." In further elucidation of the importance of this subject, I might observe that the great staples of this State, are exotics. Rice is a native of Ethiopia, whence it was carried into India, thence to Italy and extending its progress, was in the year 1693, introduced into this city.* Cotton, another exotic, supplanted

* "Landgrave Thomas Smith, was Governor of the Province in 1693, had been at Madagascar before he settled in Carolina. There he observed that rice was planted and grew in low and moist ground. Having such ground at the western extremity of his garden, attached to his dwelling house, in East-Bay-street, he was persuaded, that rice would grow therein, if seed could be obtained. About this time, a vessel from Madagascar, being in distress, came to anchor near Sullivan's Island. The master of this vessel inquired for Mr. Smith, as an old acquaintance. An interview took place. In the course of conversation, Mr. Smith expressed a wish to obtain some seed rice to plant in his garden by way of experiment. The cook being called, said he had a small bag of Rice suitable for that purpose. This was presented to Mr. Smith, who sowed it at a low spot of his garden, which now forms a part of Longitude-lane."—*Ramsay's History of South-Carolina*, vol. i. p. 202.

"The Governor divided his bag of rice between Stephen Bull, Joseph Woodward, and some other friends, who agreed to make the experiment, and planted their small parcels in different soils Upon trial they found it answered their highest expectations. Some years afterwards, Mr. Du Bois, Treasurer to the East-India Company, sent a bag of seed-rice to Carolina, which, it is supposed, gave rise to the distinction of red and white rice, which are both cultivated in that country. Several years, however, elapsed, before the planters found out the art of beating and cleaning it to perfection, and that the lowest and richest lands were best adapted to the nature of the grain; yet, from this period, the colonists persevered in planting it, and every year brought them greater encouragement. From this small beginning did the staple commodity of Carolina take its rise, which soon became the chief support of the colony, and its great source of opulence."—*Hewitt's Account of the Colonies of South-Carolina*, vol. i. p. 119.

Indigo,* and, about the close of the last century, became

* My enlightened and excellent friend, Benjamin Elliott, Esq. directed me to the information contained in the subjoined letters. These documents enrich the archives of the Charleston Library Society. Most laudable exertions are now making by this Society to collect and preserve all original papers relative to the history of this country, and of Science in general; and the public will owe a debt of gratitude to every individual who shall add to the collection any relics of the history and discoveries of gone-by-times. A Standing Committee is appointed by the Society to receive all contributions to advance the above named objects.

"*Charleston, July, 18th,* 1808.

"*Dear Sir,*—I remember to have heard my mother say, that when her father, Governor Lucas, was at his government of Antigua, he used frequently to send her tropical seeds and plants, with the culture of which at his plantation, at Wappoo, she used to amuse herself. Among other seeds sent by him, which she cultivated, was some Indigo seed, which gave occasion to the introduction of Indigo, as one of the staples of this country. Twenty odd years ago, I requested her to commit to writing what she recollected of this subject; and I now inclose you the copy of a letter which she wrote me in consequence thereof. I have not had time to search for the papers you requested me to do, but will at my first leisure.

I now send in this inclosure the account of our Revolution in the year 1719, though I presume you must have seen it; in which case be so good as to return it by the bearer.

I am, very respectfully, your most ob't. serv't.

CHARLES COTESWORTH PINCKNEY.

To David Ramsay."

"*September 10th,* 1785.

"*My Dear Child.*—You wish me to inform you what I recollect of the introtion and culture of Indigo in this country. You have heard me say I was very early fond of the vegetable world: my father was pleased with this passion, and encouraged it; he told me the turn I had for those amusements, might produce something of real and public utility, if I could bring to perfection the plants of other countries, which he would procure me. Accordingly, when he went to the West-Indies, he sent me a variety of seeds, among them the Indigo. I was ignorant both of the proper season for sowing it, and the soil best adapted to it. To the best of my recollection, I tried it March, 1741 or 1742, it was destroyed, (I think by a frost) the next time in April, it was cut down by a worm; I persevered to a third planting and succeeded, and when I informed my father it bore seed, and the seed ripened, he sent a man from the Island of Montserrat, by the name of Cromwoll, who had been accustomed to making Indigo there, and gave him high wages; he made some brick vats on my father's plantation, at Wappoo Creek, and there made the first Indigo It was very indifferent, and he made a great mystery of the preparation, said he repented coming, as he would ruin his own country by it, for my father had engaged him to let me see the whole process. I observed him as carefully as I could, and informed Mr. Deveaux, an old gentleman, a neighbour of ours, of the little knowledge I had gained, and gave him notice when the Indigo was to be beat; he saw, and afterwards improved upon it, notwithstanding the churliness of Cromwoll, who wished to deceive him, and threw in so large a quantity of lime-water as to spoil the colour. In the year 1744, I married, and my father made Mr Pinckney a present of all the Indigo then upon the ground as the fruit of my industry. The whole was saved for seed, and your father gave part of it away in small quantities to a great number of people that year, the rest he planted the next year at Ashepoo for seed, which he sold, as did some of the gentlemen to whom he had given it the year before:

generally cultivated; and from a single Coffee plant* taken from the gardens of Paris, and preserved with great care in its voyage to the West-Indies, a principal source of wealth to that country proceeds.

These facts should direct our attention to advantages to be derived from the climate and location of our native

by this means, there soon became plenty in the country. Your father gained all the information he could from the French prisoners brought in here, and used every other means of information, which he published in the gazettes for the information of the people at large.

The next year Mr. Cattle sent me a present of a couple of large plants of the wild Indigo, which he has just discovered. Experiments were afterwards made upon this sort which proved to be good Indigo, but it did not produce so large a quantity as the cultivated sort.

I am, your truly affectionate mother,

ELIZA PINCKNEY."

* "There are few more important articles in commerce than Coffee. The immense quantities which are annually imported into Europe from the East and West-Indies and the Brazils, are almost incalculable. The consumption of this berry is also great in this country; but inconsiderable when compared to the quantities used in the south of Europe.

Coffee is a native of the East; and the first fresh seeds which were brought to Europe were planted by a gentleman of Dijon, in France, in the year 1670. The shrubs bore fruit, but the berry was flat and insipid—and there appeared no prospect of advantage from its cultivation, it was neglected. Afterwards a burgo-master of Amsterdam sent a flourishing Coffee Plant to Louis XIV. in 1714, which was the original stock, from whence sprung all the Coffee shrubs on the plantations in the West-Indies.

In the year 1720, M. de Clieux, an officer in the army, who owned a plantation in Martinico, formed a project of settling in that island, and attempting the cultivation of the Coffee shrub. He happily obtained with some difficulty a young plant from the King's garden—which he regarded as a valuable treasure, and embarked in a ship for Martinico. The vessel had a long passage, and the whole crew were put on a short allowance of water; but M. Clieux was very careful of his little Coffee plant, and divided with it daily, the small quantity of water which came to his share.

When M. Clieux arrived at Martinico, his first care was to plant his Coffee shrub in the most favourable spot in his garden. He watched it carefully—indeed it was the principal source of all his pleasures and hopes. The first crop produced about two pounds of berries, which he divided with those of the neighbouring planters, whom he thought would be most likely to attend to the cultivation of the shrub.

After the second picking, they were enabled to extend the cultivation of Coffee to an almost indefinite extent. At this time, a severe hurricane took place, and destroyed all the cocoa trees on many of the plantations. The Coffee tree was substituted in their place, and in a few years it became a great revenue to France, and wealth to the planters.

The inhabitants of Martinico evinced their gratitude to M. Clieux for the service he had rendered them by introducing the Coffee-tree into the Island, by annually subscribing and raising the sum of 20,000 livres, or $5,000, which they paid him every year till his death, which happened many years afterwards.

Coffee was introduced into Hispaniola in the year 1738. The inhabitants of that Island erected in 1774 a statute to the memory of M. Clieux, as being the father of Coffee plantations.

State, and urge the enterprize of her Agriculturalists, in discovering other staple commodities to advance their fortunes and benefit her interest. A vast range of country has been found congenial to the culture of similar products with her soil. Rice is imported from India into Europe; China feeds her teeming population from its excessive increase. Italy is aided by its abundance in the support of her starving crowds—the Russians obtain a supply from Siberia, and varieties are found on high and low lands, supplying the necessities of man. Cotton, though not cultivated beyond the 34th degree of latitude, has an immense extent of country congenial to its production. Egypt, Brazil, and the East Indies, supply the manufactories of Great-Britain alone, with 68 millions of pounds; the United States furnish upwards of 152 millions to the same manufactories, besides large supplies to her own, and to those of other countries; and united with the West-Indies, Colombia, Turkey and Greece, ample folds are spread through every quarter of the globe. In Europe, ignorance of the manner of cultivating Cotton, has hitherto, and does now retard its production, for the possibility of raising it, has been fully established. Charlevieux records in his letters from Italy, that in the kingdom of Naples, in the province of Sorento, the villagers, enticed by the value given to the plant by the continental system of Napoleon, furnished, in

Production of Coffee throughout the world, in 1833.

Brazil,	92,432,240lbs.
Java,	40,000,000
Coast of India and Arabia,	30,000,000
Cuba,	50,000,000
Porto Rico,	15,000,000
St. Domingo,	40,000,000
British West-Indies,	20,000,000
French West-Indies,	15,000,000
Dutch West-Indies,	10,000,000
Spanish West-Indies,	10,000,000
	342,432,240lbs.

Consumption of Coffee, in 1833, *copied from an Antwerp paper.*

Low Countries,	90,000,000lbs.
Germany and the Baltic,	70,000,000
Spain, Portugal and the Mediterranean,	65,000,000
England and Ireland,	25,000,000
France,	24,000,000
United States,	80,000,000
	354,000,000lbs.

the year 1812, nearly 60,000 bales of cotton to the manufacturers of Europe. Yet these experimentalists tended the crop with the spade instead of the plough and hoe, and had no machinery to separate the seed from the staple.

(To be continued.)

Art. LIV.—*On Hay-Making; by* B.

Dear Sir,—The following notes on Hay-making are from some farm *memoranda*, and may be relied on as containing information obtained from practical men. They shew how readily we might be supplied to the extent of our consumption by the home production; to say nothing of the large supply of rice-straw for winter food, and the inexhaustable resources to be found in our salt-marsh, which when cured, makes an excellent hay, as will be found stated in Mr. Cuthbert's address;* and the accuracy of which has been fully confirmed by the writer of this notice.

Why, therefore, so large an importation of this essential article, from the North should be necessary, deserves some inquiry; whatever is profitable men will pursue, and undoubtedly it would appear, if such large productions of hay can be obtained, the cultivation of it would be followed. In practice, the following difficulties have been experienced: hay is a very exhausting crop, and unless large returns of manures are made to the land, cannot be produced in considerable quantities. It will be seen that from 30 to 50 cart loads to an acre, are necessary to the yield of 5000lbs. Now each cart load, if carted one and a half to two miles, may be said to cost 50 cents. This makes the charge of manuring an acre from 15 to 25 dollars. Then comes the cost of mowing: the charge, if a mower be hired any where near the city, is $1.50 per acre, and the task, if given to our own hands, is half an acre; and

* See Vol. iii. p. 593, *Southern Agriculturist.*

then, again is the carriage to market. A single horse-cart cannot carry more, when loosely packed on, than 400lbs. When the crop is large it will be at once seen, what a great labour this is. The transportation of two bags of short cotton worth $80, can be more conveniently made, than of 400lbs. of hay worth $2.50. The use of the screw for packing in bales, somewhat obviates this difficulty; but this also is a heavy charge, in proportion to the value of the article, say 10 cents on each hundred weight.

Now, at the North, these objections are overcome: first, by connecting stock farms with hay-making, which may be regarded as indispensable; lessening, in this way, the heavy charge of manuring, and placing against it the profits of the dairy. Secondly, by keeping the land in good state for mowing, in consequence of which more labour can be performed by the mower, and even machines for mowing can be used. Then, packing by machinery, and transportation by water; but, perhaps, the chief and most important consideration, is that large capitals are engaged in this business, and things are done on a scale that makes small profits afford a good income. Small farms cannot carry on hay-making as an exclusive business to much advantage; but as incidental to the crop, it sometimes makes an addition worth the labour. The use of plaster is of vast importance in the cultivation of grasses, especially clover, but even with the advantage of this manure, (as well as the writer has been informed) the average crop in the Middle and Northern States, is not more than 2000 lbs. per acre. This is usually worth here 7½ dollars per 1000lbs., making the gross product of the acre 15 dollars. Now deduct from this, the charge of cultivation, mowing, making, packing, carriage; or freight, storage, wharfage, commission charges, exportation; and again, the charges attending freight, landing, storage, and sales; and it will be seen the profits cannot be large, indeed, that they must be very small. A great proportion of these charges act of course directly in favour of the home production; and no, doubt if planters of capital would enter on the business properly, establishing dairy-farms in connexion with it; erecting screw-presses, and attending to the level condition of the land for mowing, it might be made as profitable as cotton or rice, and more so in many situa-

tions. With these preliminary remarks, I add the notices above referred to.

August, 1823.—Mr. J. L. informed me that in 1813, on his farm near Charleston, he made the experiment of the comparative profit of hay and grass, (grass sold green in bundles) from one acre. On land manured one wheelbarrow full to every 10 feet square, 7 wheelbarrows to a cart-load. He cut, in two cuttings, 22,000 weight of green grass, which made, when dry, 5500 weight of hay, which sold at that time at $1.50 per cwt. (it was during the war, and the price unusually high, probably in part from the interruption of communication with the source of supply, but chiefly from the demand for troops in and near the city,) which made for the acre $82 50. At the same time he was selling bundles of grass of 20 weight 6¼ cents, making $75 per acre; the difference in favour of hay, $7.50. He thinks, when no other crop is made, 7000lbs hay could be made from an acre; making at the rate of fifty single horse-cart loads.

Mr. D. on Charleston Neck, states, that when grass is ripe, it will not lose one-half in making into hay. If very green, it will lose three-fourths of its weight, and that he thinks 7000lbs. of hay could be made with 30 single horse-cart loads of manure to an acre. Of course the quantity of manure necessary, must depend on the previous condition of the land.

The writer of this communication, on the 15th of July, 1823, cut from a plot in his garden, measuring 180 square feet, 150lbs. green grass, which, from an acre producing throughout at the same rate, would be 36,750lbs. of green grass.* The grass was in its greenest and most succulent state; the soil a good mixture of clay and sand, and highly manured.

Much has been said of the crow-foot and Gama-grass, and some years ago of the saintfoin. When the products of these are large, the lands must be fresh and good, or their roots probably penetrate further, (as is the case especially with the saintfoin) and exhaust the soil more thoroughly. But nothing is more erroneous in speculation, than to hope to obtain a grass, to produce large crops from poor soils. B.

* The *crop-grass*, commonly called the crab-grass.

Art. LV.—*On Native Grasses; by the* Editor.

We intended, agreeable to promise, in our September number, to offer some remarks in our present number, on the importance to the planter and farmer, of the cultivation of such grasses as are adapted to our climate and suited to the making of hay. The sensible remarks of our correspondent "B." render a part of the observations we intended to make unnecessary. We will take it for granted, that this subject has been but too much neglected; and in our visits to the interior of this State, we could not but feel somewhat mortified at seeing bales of hay originally put up in New-Jersey and New-England, transported 30 or 40 miles beyond Columbia, and which had passed through a country as productive in the materials for haymaking, as any other in the United States.

There can be no doubt, but a little attention of the planter, directed to the subject of the grasses best suited to his soil, and a little direction as to the mode of mowing and curing his hay, would in a very short time, remedy the evil complained of, and render our State as productive of hay as any in the Union.

We have, for a few years past, directed our attention to such native and exotic grasses as we thought adapted to our climate. Our experiments, however, were made on a very small scale, and confined to a garden in the suburbs of our city. They are simply given as experiments not always satisfactory, even to ourselves, and we lay them before the public, under the hope, that those who have had more experience that ourselves, will favour us with the result of their experiments.

On the borders of our walks and beds, we have been in the habit of planting the three following species of grass, viz. the Cock's foot, or orchard grass, *(Dactylis glomerata)* —and another species, which here goes under the name of Lewis & Clark's grass, from the circumstance of its having been asserted that those intrepid explorers of the Western wilds had introduced it into the Atlantic States, this, however, is a mistake, asit has long been cultivated in Europe, and known by botanists as the *Holcus lanatus* The third species is the Blue grass.

All these, not only give a fine appearance to the garden, and are refreshing to the eye, but enable the owner to cut a sufficiency of grass to feed a pair of horses, at least during the summer season. The two kinds first mentioned are usually preferred, and yet, as far as our observations have extended, we give the preference to the latter, as being less liable to injury from the summer's heat, and producing a greater quantity of grass in the course of the year than either of the other kinds. They are all perennial, and may be cultivated with great ease, either by dividing the roots or by sowing the seeds. It is questionable whether they will ever be cultivated to any great extent, in consequence of their being so easily overrun in our fields by more vigorous grasses and by weeds.

The Partridge Pea, *(Vicia sativa.)*

We have seen hay made from the Partridge Pea, that was preferred by cattle to any other hay or grass. But this vetch produces but a single crop very early in the spring, and then disappears. It is an annual, and requires so much attention to produce even a moderate crop, that as long as we have so many better materials for haymaking, we will probably neglect the Partridge Pea.

Guinea Corn, *(Panicum miliacum.)*

When well manured, the Guinea-Corn produces abundantly, and may be cut at least three times in the course of a summer. It is an annual, but the grains are easily preserved, grow readily, and the plant is subject to very little injury, either from insects or from the seasons; but the grass from Guinea-Corn, unless cut very young, soon becomes hard, and is not eaten very freely by our cattle, and we have found that they invariably give the preference to Guinea-Grass and Egyptian Millet. We have never had an opportunity of examining any hay that was made from the Guinea-Corn.

Red Clover *(Trifolium pratense)* and the Herd's or Timothy-Grass, *(Phleum pratense.)*

In our attempts to cultivate these grasses, we have met with no success. The seeds vegetated, and some of the plants did well during cool weather, but were almost invariably destroyed by the heat of the summer; they evidently require a colder climate than ours.

The Salt Marsh-Grass, *(Spartina glabra.)*

Our salt-marshes are inexhaustable treasures to our planters, who reside in their vicinity, and we have seen hay in small quantities made from our salt-marsh that was very palatable to cattle. But the trouble of cutting the marsh will probably for a long time deter the planters from resorting to this source for a supply of hay even for their own consumption.

Guinea-Grass, *(Holcus polygamum.)*

This has for many years been considered as one of the most productive grasses in the world. It is, however, we think, less so than the Gama-grass or the Egyptian Millet, still it is, in many respects, one of our most valuable grasses, and were it perennial with us as it is in the West-Indies, it would probably be preferred to all others; but the roots of the Guinea-grass are in our climate almost invariably destroyed every winter, and it becomes with us an annual. The seeds are collected and preserved with such difficulty, that persons who have cultivated the Guinea-Grass, have found it necessary to suffer a small portion of it to produce seeds, which, when ripe, were suffered to fall to the ground, and the spot was dug up in the fall and sometimes covered over with straw to shelter the seeds from the frosts of winter. From these nursery beds a sufficient number of plants were produced in the spring, for the limited wants of the individual, and we do not recollect ever having seen more than a half acre of land cultivated at one time on any plantation with this valuable and very productive grass. The plants should be transplanted a foot apart in rows, which may be about two feet asunder, they require one or two slight hoeings.

Crop or Crab-Grass, *(Digitaria sanguinalis.)* Crow-foot-Grass, *(Eleusine Indica.)*

These well known and highly valuable grasses have been almost the only kinds from which hay has heretofore been made in our Southern country. Although both annuals, the seed is known to drop of its own accord in such quantities in all directions, that the land on which they are to be cultivated, does not require to be sown. Still it is requisite to manure and plough the land annually, in order to make a profitable crop. Both these grasses,

and especially the latter, come late in the season, and the ground does not afford pasturage for cattle for a considerable portion of the year. The hay, however, made from these grasses is abundant and nutritive. When properly cured it is equal to Northern hay. But few of our planters have paid much attention to the curing of hay; it consequently comes to our market under many disadvantages. In many instances, the grass is not cut until the stalks are dry and exhausted. It is then frequently cut and gathered with the hoe, and in this state full of the roots and sand, it is brought to our market, and it is not surprising that it frequently rejected as a very inferior article. Either of these grasses, however, possessing the advantage of not requiring to be annually sown, and affording an opportunity of raising a crop of rye, wheat, barley, or oats, would in our Northern country be regarded as little inferior to clover.

Egyptian Millet, *(Pennisetum typhoideum.)*

This plant, a native of Egypt, and which Linnæus named *Holcus spicatus*, but which is figured under the above name in the splendid work on Egypt, in the Charleston Library, was, we think, more generally cultivated about fifteen years ago than it is at present. Of all the annuals which we have cultivated, as grasses, we give this the preference. As far as our observations extend, we have found it to be decidedly the most productive grass* that we have cultivatated. It may be cut, on an average, about every two or three weeks during the summer. Horses prefer it in a green state to any other green food; and a few beds not amounting in all to forty feet square, have saved us the expense of purchasing hay for a horse during the whole of the summer. The seed of the Egyptian Millet comes to great perfection in this climate, and is easily preserved. It may be sowed in drills as soon as the danger of frost is over; the plants may be easily transplanted in the manner of the Guinea-grass, they require one or two hoeings, when young, and the luxuriance of their growth will afterwards prevent them from sustaining any injury from surrounding vegetation. An acre or two of ground in the neighbourhood of Charleston, cultivated for the express purpose

* The term grass as applied to the Egyptian Millet, is not strictly correct, we use it not botanically, but as horticulturists.

of supplying our market with green food for horses, would, in our opinion, be infinitely more profitable than rye, barley, or any o four annual grains or grasses. We have seen small quantities made into hay, of which the cattle appeared as fond as of corn-blades, to which it bears some resemblance.

Gama-Grass, *(Tripsicum dactyloides.)*

Much has been written within a few years on the subject of the Gama-grass. The only experiments that we have seen made in cultivating it, were on a limited scale, not exceeding any where a quarter of an acre, it is known to thrive well in almost any situation; we have seen it growing in places where the roots were covered with salt-water at every high tide. It also resists drought. It is a native and perennial, and although we have found the seeds difficult to collect, and not easy of vegetation, yet the roots can be easily separated, and the plant multiplied to almost any extent. We have cultivated this grass during the present season. It was set out four feet apart on rather a poor soil recently reclaimed from the salt-marsh, the growth exceeded our expectations, and yet it was far inferior to that cultivated in the garden of a friend who accompanied us on an expedition to procure the plants. His plants were set out in a rich garden spot, and all who saw them were struck with their vigorous and luxuriant growth. This, together with all the observations we have been able to make on the subject of grasses, convinces us that they always produce more abundantly in rich than in poor soils.

The objection to the Gama-grass is, that unless cut when very young it becomes coarse and hard, and cattle refuse to eat it. This observation, however, will apply to many other of our grasses. Cattle will turn away from plants whose juices are exhausted, and almost invariably prefer those that are young and succulent. Hay made from Gama-grass, when cut young, is greedily eaten by cattle, but is rejected as the plant grows older. We send you for the inspection of such planters as feel an interest in the subject, a small bundle of the Gama-grass cured a year ago. We recently tried an experiment with a portion of the same which was placed before our horses, giving them at the same time some Northern hay from which

they could take their choice, and we found them eating both indiscriminately. We have conversed with intelligent planters, members of our Agricultural Society, who consider the Gama-grass as of no great value. They had, however, made their experiments on a very limited scale, and some seemed to object to it from the circumstance of its being so common on their plantations as to be regarded as a troublesome weed. Our own experiments have not been long enough continued to enable us to speak positively of the result. We find, however, in the *American Farmer* of the 19th August, of the present year, the result of experiments made on the nutritious qualities of this grass by a gentleman of Alabama, who signs himself "Agricola," which we extract for the information of those who may not have read that communication. "As regards its nu-
'tritious qualities," he remarks, "I must claim for it a
'higher rank than corn blades. The following experi-
'ments determine the point with me. With this grass
'alone, and as much salt as the animals would consume,
'I fed two mules fourteen days, twelve of which they gin-
'ned two thousand pounds of seed-cotton per day, and at
'the end of that period it was determined by competent
'judges that they had retained their flesh. They had as
'much as they could stand by. Now, Sir, I know from a
'trial made through necessity that I could not have done
'this with corn-blades. I fed a horse of a large size for
'the same period on this grass, allowing eight ears of
'corn per day. This horse I rode daily from five to fifteen
'miles, he evidently retained his flesh. I worked a pair
'of oxen regularly for two weeks fed on this grass exclu-
'sively, with salt; they mended. In every case I gave as
'much as the animals could eat."

We think it probable, however, that the product of the Gama-grass has been considerably overrated from the simple circumstance, that when planted as an experiment it has been usually placed in the richest and most eligible ground that could be found on the plantation or garden. On the contrary, where we have seen this plant growing in its native localities on the plantation of Mr. Heyward, near this city, and on many of our Sea-islands, it was far less luxuriant, and in our opinion, requires cultivation and manure to be very productive. We could wish to see a few acres in the neighbourhood of Charleston, set

out with plants of the Gama-grass, and cultivated with the express purpose of supplying our market with grass and hay. The seeds may be collected with some trouble, by picking them from the stalks by hand when nearly ripe. If, on the contrary, they are suffered to drop to the earth, the best of them are destroyed by mice, and the vegetation of a great portion of the remainder is injured by an exposure to weather on the surface of the ground, these seeds are usually sent to a distance, and not one in a hundred is found to sprout. The roots, however, may be easily packed up and sent to those who may wish them, and they increase so fast, that those who once have a plant will in a year or two, have an abundant supply. They may be taken up and separated at any season of the year. A single root which was planted in January last, we in the month of July separated into twenty-four plants, all of which are now in vigorous growth.

Rice-Grass, *(Leersia oryzoides.)*

This grass has been much longer known by botanists than by agriculturists, a proof of how much science is aided by the practical experiments of the farmer. For the introduction of this grass into notice, we are indebted to Mr. Richard Sondley, an intelligent merchant of Columbia, (S. C.) who is also an industrious and practical planter. Finding it growing very luxuriantly on his low grounds,—and that his horses and stock were fond of it, he directed his attention to the curing of it into hay, which he sent to the Columbia market. An interesting article on this subject by Mr. Herbemont, is found in the January number of the present year. Since that time, we have had the pleasure of a conversation with Mr. Sondley on the subject of this grass, and although we have mislaid the notes taken on that occasion, and are obliged to trust to memory, yet we believe we are correct in stating as the result of Mr. Sondley's experiments, that the hay which he made from a little more than five acres, sold in the Columbia market for $900; this, then, is a profit greater than our best rice or sea-island cotton land can, on an average, be made to produce. With regard to the goodness of the hay made from the Leersia Mr. Sondley mentioned, that he kept on sale, at his store in Columbia, hay made on his plantation from this grass, as also the

Northern hay in bales; and that those who once made use of the former, preferred it to the latter, at the same price, and that his Northern hay remained on hand till all the other had been sold. It affords us great pleasure to state that the Leersia grows very abundantly in our low grounds, in South-Carolina and Georgia, and is found flourishing luxuriantly on our sea-board, and within a few miles of this city. We have had specimens in our herbarium, collected several years ago on a plantation near Charleston, but not being acquainted with its value to the agriculturists, we did not then notice the abundance of its growth. We have, however, observed it more carefully this summer and have recently examined it in several localities, particularly on the plantations of George Chisolm and Nathaniel Heyward, Esqs. six and seven miles from this city, and cannot withhold expressing our sanguine opinion, that this grass is calculated to be of very great importance to our Southern agriculture. We send to the office of our publisher, Mr. Miller, specimens of this grass, for the inspection of those who may take any interest in the subject. It will be perceived, that the covering of the seeds bear a strong resemblance to rough-rice—hence the name (*Oryzoides*, like rice.) The seeds from the Rice-grass are very abundant, and may, we think, be easily collected, and when once introduced into our low moist grounds, would outgrow all other grasses and weeds and require but little cultivation. This grass is believed to be perennial and like the Northern Timothy, when once introduced into a meadow, will continue to flourish for many years. We question whether the Rice-grass would do well on high ground, but in all moist lands and even in grounds partially covered with fresh water, it grows luxuriantly and certainly is an infinitely more productive crop than Northern Timothy or Herd's grass. Thousands of acres too wet for cotton, and not adapted to the culture of rice, that are now wholly unproductive, might be cultivated with this grass, and yield a handsome profit to the planter. Facilities will be easily afforded by our navigable streams and Rail-roads, to transport this somewhat bulky article to our cities in the South, but it is certainly better to do this than to be at all the expense attendant on its transportation, from seven hundred to a thousand miles.

The mode which we would recommend in cultivating this valuable grass, is the following. Let the planter learn to know it on its being pointed out to him by a botanist, or some one acquainted with it.* Let him send a careful servant in the latter end of this month to collect the seed, or he may obtain it from some one in whose neighbourhood it may be abundant. Let him at his leisure, during the fall or winter, cut down the weeds and sedges that at this season are covering all our low grounds, and let him, if possible, burn them on the ground. Between the months of February and April, the earth should be a little stirred, and if not too wet, the harrow might be advantageously used, and the seeds sown broadcast. Perhaps a little care might be requisite in the following season, to remove some of the coarser grasses that grow in such situations. After the first year no further labour would be requisite, but cutting and curing of the grass. It may be cut three times during the summer. If it is to be conveyed to a distance, it may be made into bales by the common screw-press used by cotton planters. May we not hope that during the next season, hay made from our native Leersia, will be found for sale in our market.

Let us no longer be led away by the erroneous opinion, that our soil and climate are not adapted to the cultivation of such grasses as can be made into good hay. We have the Crab, and the Crowfoot, and Guinea grasses, as well as the Rye-grass, *(Elymus Virginicus)* and the Egyptian Millet, as annuals, and we have as perennials, the Gama and the Rice-grass adapted both to our high and low-grounds, and the latter especially, yielding a hay equal in quality and more abundant in quantity to the most fertile lands of the North.

* It is described in Elliott's Botany, vol. i. p. 101,

ART. LVI.—*On Cichorium Intybus, wild succory or Endive; by* COLUMELLA.

The importance of this plant will be seen by the following extracts. It is spoken of in England, as an early food; with us it would probably do well through the winter, as other kinds of endive flourish best in that season.

From *Young's tour in France, Pinkerton's edition*, p. 283. "I have the satisfaction to find that M. de Pahciel, has as great an opinion of Chicory as ever. That his brother had adopted it—that it was very flourishing on both their farms, and on those of their neighbours also. I never see this plant but I congratulate myself on having travelled for something more than to write in my closet, and that the introduction of it into England would alone, if no other result had flowed from one man's existence, have been enough to show that he did not live in vain."

See, also, *Domestic Encyclopædia*—Art. *Chicory*—where it is stated that it has yielded from twenty to forty tons of green fodder per acre. It has been sowed broadcast, but answers better in drills. It defies drought, being of early growth. The root is perennial. It makes nourishing hay. Its produce is said to be superior, upon the whole, to Lucerne in the proportion of three to one. A piece of ground was found to yield by the acre, the year of sowing, at two cuttings, July and October, 19 tons 4 cwt. Second year, three cutting, May, July and December, 38 tons 9 cwt.; and thc average produce of four years was nearly 30 tons. The acre yields from 150 to 350lbs. seed.

See, also, *Gleansings of Husbandry.*—It will thrive on most soils. Is sowed, 10lbs. seed to the acre. In England, either with or without clover and other grasses. Has been cut three times in a season, first the 20th of May. Given as soil to horses, when hard worked, without either hay or corn. With sheep and pigs it is supposed to succeed even better than with large cattle. The Swedes, in times of scarcity, make a bread from the roots.

This plant would most probably prove a great addition to the resources of the farmer in this country, especially during the winter and early in the spring. If it has

not been noticed before in your periodical, it would be well to introduce it to the notice of our agriculturists; and the public would be indebted to any one who would try it, and publish the result.

COLUMELLA.

ART. LVII.—*The Flowering Plants of Japan; by* P.

Mr. Editor,—In a report lately made to the *Horticultural Society* of this place, (Charleston.)* It is stated that this class of flowering plants retain their constitutional habitudes *of blooming in December and January, which are the summer months of their native country!*

This is a mistake, Japan is not in the Southern hemisphere, but is, on the contrary, in several degrees of latitude North of our own parellel, and, indeed, as well as China, with a climate much resembling the climate of the United States. It would, therefore, appear that the winter is the proper season for these flowers. An error of this kind may lead to the mistaken modes of cultivation, and I am, therefore, induced to send you this notice of it.

P.

The mistake, we believe, occurred in the report as it was printed in the newspapers; it must have been occasioned by some inadvertance. The writer of that report is known to be one of the best geographers in this country, and in the copy which he himself prepared for this journal, the error does not appear.—*Ed. So. Ag.*

ART. LVIII.—*The Teak Tree; by* A.

Mr. Editor,—This tree is classed with oaks for the uses of which it is applied, and in consequence, many are under the erroneous impression, that it belongs to that botanical

* See page 442, Southern Agriculturist for August.

class of trees. I find the following notice of it, in the volume on timber trees, in the Library of Entertaining Knowledge.

"Though the Teak Tree, *(Tectona grandis)* be a tree of quite a different family from the oak, and a native of India, it is used in ship-building, like the oak, and has some resemblance to it in timber. It is a tree of uncommon size, with leaves twenty inches long and sixteen broad, and bears a hard nut. A specimen was introduced in the royal gardens at Kew, about 60 years ago; but from the warmth of the climate of which it is a native, it can never become a forest tree in England. Besides its value as timber, the Teak has great beauty as a tree. It is found more than two hundred feet high, and the stem, the branches of the leaves are all very imposing. On the banks of the river Irrawaddy, in the Birman Empire, the Teak forests are unrivalled, and they rise so far above the jungle or brush wood, by which tropical forests are usually rendered impenetrable, that they seem almost as if one forest were raised on gigantic poles over the top of another. The Teak has not the broad strength of the oak, the cedar, and some other trees; but there is a grace in its form which they do not possess."

It is probable this tree would flourish in South-Carolina. But has it any qualities over our oaks and pine, which would make it an object to cultivate it?

A.

A quantity of Teak seed, sent by Dr. Harlan, to a friend in this city, is left for distribution at this office.—*Ed. So. Agr.*

Art. LIX.—*On the Spirit Gas; by* Lux.

Mr. Editor,—The march of improvement in the philosophy of chemistry, daily produces useful discoveries. The result of such investigations, when adapted to the ordinary purposes of life, seem to contribute no less to usefulness than to economy. The mind of man, always ardent in the search after new truths, is rewarded in the

labour by particular adaptations, that contribute botl advantage and emolument; and the latter appears to be the great incentive to pursue the most hazardous experiments. But such is now the aid afforded by the laws of affinity and combination, that no experiment is made with timidity upon apprehension of consequences. The application of steam for the various purposes to which it is now applied, although attended sometimes with accidents of a serious nature, has not retarded the progress of its utility, or arrested its usefulness wherever it is empolyed. A steam-boat explosion and consecutive disaster, however frequent the occurrence, creates no dismay or obstruction to enterprize: nor, is it less evident to observation, that its great advantages should be resigned, because it is often the instrument employed in promoting the ravages of death.

These reflections are the result of remarks generally made on the use of the *Spirit Gas*, or technically speaking, the *Olefiant Gas*, introduced not long since as a substitute for oil, to give light at night in dwellings and stores. Apprehension of danger from its use—the notice of accidents—and the strong prejudice that would influence the mind, have urged the writer of *this*, to give a statement of the properties and utility of this article; and to dwell somewhat on the imaginary danger attending its employment as a substitute for lamp-oil.

The *Spirit* or *Olefiant Gas*, in contradistinction from an elastic fluid, obtained from coal and other substances, is the product of a combination of certain inflammable liquids, which, when volatilized by heat burn with a flame, yielding a light as agreeable and strong as light obtained from any inflammable body. There have been in use, and now employed, several combinations, designated Spirit Gas, as various in their properties as their intensity of light given out by their inflammation. Each of these, for economy in consumption, and for safety, are employed in particular vessels, or lamps, or apparatus of proper construction. Improvements in these are made almost daily, and each possess their advantages. I shall proceed, first, to speak of the constituent principles of some of these combinations, each having claimed preferment.

Rectified oil of turpentine in combination with a portion of alcohol, of particular strength, was introduced by means

of a broad flat wick, in a lamp so constructed as to require a round or oval glass, and this so graduated and fixed as to occasion rapid consumption of the fluid drawn up towards the inflamed wick, by capillary attraction; which, keeping up a regular supply of fluid became volatilized, and consumed before it could escape into vapour. The steadiness, brilliancy and regularity of the flame, gave it ready preference over the ordinary oil-lamp, particularly as its consumption, and the price, was less; alike all improvements, it could not resist the objections raised against it; which objections were not unsubstantial. It was found subject to inconvenience and disagreeable consequences, namely, creating smoke when subjected to a rapid current of air, and giving out a strong and unpleasant smell similar to that of burnt turpentine. Offensive to some, agreeable to others, and by no means attended with the slightest injurious effects. It was finally made to yield to its unavoidable objections, and its use became limited; still it is employed to light stores, public establishments and other other places, which require strong light.

In relation to danger from accident or uncontrolable causes, the mind, ever active to indulge in apprehension, conferred on it imaginary evils, such as spontaneous combustion, explosion, rapid conflagration wherever it was scattered, and ruin to every thing it came in contact with. Still no such results have been known; and when by carelessness or accident it was made to inflame, its inflammation was not rapid, nor injury in any was so effective as represented or attributed to it. Such objections were made to yield to reason and observation. As no alteration or modification in smell or smoke could be suggested, it was brought comparatively into disrepute.

Coexistent with it first introduction, the spirit of opposition was raised, by heated imaginations, from the *facula* of prejudice, and new inventors sprang into notice with their new combinations; all avowedly possessing the same compound, alcohol and turpentine, made to represent by a certain agent, a hemogenous fluid, in colour very like common water, but evidently dispossessed of the two strongest objections against the first, namely, smell and smoke. Improvement followed improvement, with the same rapidity as their admirers and venders hurried its

employment before the public. All were desirous to render it the medium of emolument and monopoly. Among several aspirants for fame, as inventors, and harvesters of the *quid pro quo*, arose one more keen than the rest, known by the name of *Gennings*, who, after years of experiment, and thousands expended, (according to fame) applied for and obtained a patent for burning alcohol and turpentine, claimed as a discovery which it becomes our duty now to make known to the uninformed, is to be found in several old chemical works, particularly among the French, and long tried by many of our own chemists, either by design or accident. This very fact long known and published, to wit, the union of alcohol and turpentine producing flame, adapted and used for the purpose of giving light, was made the substantial grounds for a *patent right*, which the present proprietor calls his own, and has derived no inconsiderable emolument therefrom.

Among the scientific, in the department of chemical phylosophy, the absurdity of a new claiment for experiment and advantageous result was soon developed. The uninformed were instructed that essential oils and certain resinous substances would, in combination with alcohol of particular strength, produce the same effect when subjected to the same mode of inflammation. Some enterprizing and interested men, with no indifferent regard to the profits of such a business, sprung up like *mushrooms* of the day, displaying large heads, which when examined were found to contain, *nothing*.

The same inducements that prompt different individuals in the ordinary course of life, to engage in the same trade or profession, urged new adventures on this money-making expedition; and to engage also in enlightening communities, particularly those *in the dark*, who are always ready to embrace new objects, or encourage as they suppose, native discoveries.

The use of *Spirit Gas*, having been introduced in our city of late, and somewhat encouraged, notwithstanding the prejudice raised against it, has induced this notice, with a view to an inquiry into the danger, (if any) attending its employment.

Conversing with the individual who manufactures this article, he undisguisedly states, that the *Spirit Gas* is the commixture of alcohol and turpentine, holding in combi-

nation a substance, that tends to destroy the otherwise too rapid inflammability of either of the ingredients, hence removing the tendency to rapid consumption, or sudden explosion, a circumstance never known to occur. It is, however, undeniable, that the combustibility of the ingredients is such, as to render it liable to rapid ignition, and so would alcohol, or spirit of any kind, if incautiously brought near the fire; still, the idea of rapid explosion similar to burning gun powder, is as ridiculous as the verity of the Arabian Nights' Entertainment. But, admitting that danger does accompany its use—the construction of the tube—total inadmission of air to the vessel containing the fluid, and impossibility of escaping, at once removes all apprehension, and renders it as safe a light as any from lamp oil.

The peculiar properties of this Olifiant Gas, is, that it recommends itself as a substitute for lamp-oil, less objectionable as to smoke, smell, or unsteady flame, and requiring no trimming or raising of the wick with regard to light, as clear and bright as that from any of like magnitude. Having used the fluid for some months, a confidence in recording its advantages, inspires the writer to speak of it, yet with no view of recommending it to public notice. Thousands use a fluid somewhat similar in Europe and the United States, and we seldom hear of an accident, except these published, which were caused by neglect or carelessness. We learn that in our own city, there are upwards of forty families who constantly use it in their dwellings, and to the exclusion of lamp-oil or candles.

We entertain the belief, that with the improvements of the day, we shall have in time a more acceptable article for the same purpose, and superseding all others for safety, brilliancy and economy. It pertains to a liberal community to countenance all new discoveries, as far as is practicable, when unattended with strong apprehension of danger.

LUX.

PART II.

SELECTIONS.

ART. LXXXVII.—*On the several Plans used to prevent the washing of Hilly Lands*; *by* C. F. N.

[FROM THE FARMERS' REGISTER.]

I perceive by your last number (9) that a Charlotte correspondent has come out in disapprobation of the "trenching" system; and recommends a substitute, for which he vouches his own successful experience. Now, though Mr. Bruce, as its original advocate, will more properly respond to his objections—and though your own editorial remarks will in some measure neutralize what I regard as the ill tendency of his piece—yet I must beg space for explanation. I ask it the rather that I have unwittingly committed myself, where I knew not that controversy was likely to arise. And particularly because I recognize in "Wardsfork," (if not deceived by internal evidence, as well as the point from which he hails,) "an acquaintance and friend," from whom I have heretofore received valuable instructions in our common calling; and I should be loath to acquisce in a difference, which may be more apparent than real.

The evil complained of is the loss of soil in broken land, produced by the washing of heavy rains. The desideratum is the proposal of an effectual preventive. We all know that formerly, in Virginia, extensive occasion was given for injury from this cause, by scourging newly cleared hills with successive hoe crops, without rest under grass—and by injudicious ploughing. By the one, the soil was worn to barrenness, and thus exhausted of the vegetable fibres which had contributed to its powers of cohesion; and the parallel furrows of the other, in their perpendicular descent, brought down soil, and substratum, to cover, with a barren coating, the more fertile land below.* This destructive course was continued by many through ignorance of a better; and even

* It is said that the late John Randolph of Roanoke, once in passing such a scene, remarked to his travelling companion, (pointing towards it with his "fearful fore finger,") "that, I take it, is very far from being *real* estate Sir."

when the era of improvement was commenced, the expediency of attempting to repair the injury already done was not universally acknowledged. "Go on," says A to B, "and while you are saving and improving one hill side, I will make another produce money enough to buy a dozen more." This riotous system could not last. The annual waste of land from this source was immense, and some change for the better became indispensable. Happily one was suggested, after our forests were much diminished, and the rage for new clearings had begun to subside.

It is more than thirty years since the late Governor Randolph introduced on his farm in Albemarle, "horizontal ploughing" and the hill side plough. Both the mode and the implement had, it seems, been known abroad long before. But to him we owe the timely bringing to our rescue the invaluable aid of the practice itself. From him the practice spread rapidly on all sides, until it became almost universally adopted—meeting a slight resistance in its course from the advocates of cross ploughing. Never was any improvement so highly lauded, or indeed more properly. And the incalculable benefit which a son of Virginia, by its means, has conferred on our whole country, will excuse a reference which might seem common-place. It instantly, as I conceive, more than doubled the value of every arable steep in our land. By its means the work was better executed—with greater ease to man and beast—and a reserve of moisture was retained, for nourishing the roots of plants at a season, and in the mode which they most required.

It was also declared to be a sure preventive of the evil in question; and perhaps, when well performed, it is a sufficient preservative of a somewhat tenacious soil on a moderate slope. But it was found not to be effectual in all cases. And while it was thus eulogized for virtues which it did not possess, some farther change, or addition, was called for.

I had heard of various expedients to meet the exigency, such as a partial declination of the beds and furrows—leaving a belt of turf unploughed at the line of stress—Mr. Skipwith's trenches—and lastly, what are termed the "graduated furrows." This last I considered most eligible, as answering the purpose, and as being free from objections to which the others are liable. It being the last in a series of improvements, of which horizontal ploughing was the first, my former remarks were predicated on their comparative value, and the necessity of this as an occasional auxiliary. The hypothetical case of the conical hill with the spiral furrow was not cited as a guide for practice, but for the purpose of illustration—and in this view, every rounded hill side may be considered as part of a cone.

All of the above modes with the exception of the second, are based on the same principle—that of providing an artificial chan-

nel, by which the redundant rain falling in a given space, may be conducted from the hill, without carrying the soil with it. Nor, I conceive, is Wardsfork's founded on a different one, but it is a mere variation from, or perhaps an improvement on that which he so pointedly condemns. There are not a few points of resemblance between them. In either case the same levelling instrument is used—the same graduation adopted. The beds and the furrows are recommended to be placed at the same intervals apart. Each commences at a middle point on the face of the hill, and proposes the descent from thence to the ravines respectively on the right and left. And if the beds be thrown up as high as Wardsfork suggests, there is above each, emphatically, a "graduated furrow," or shallow *ditch*, however offensive the name. With this difference, that what is an enbankment in the one case, and therefore safer, is but a bed in the other, *i. e.* an embankment flattened, and having its edges rounded off. It is in fact but transferring to a steep the mode of draining recommended in your No. 7. You have already said, editorially, that the turfed ravines may be used in connexion with either mode. Wardsfork lives in a region whose general aspect is materially different from that in which the writer of this resides. I suppose his hills are not long, and mostly of gradual elevation. To them, I doubt not, from his own experience, that his system of throwing up high beds at intervals, may be judiciously applied. But how would it take in our mountains, some of which are cultivated to the very tops. "This tricke," as old Barnaby Googe said of the reaping machine, "might be used in level and champion countreys, but with us I trowe, it wold make but ill-favored worke."* We have many arable hills in Virginia so steep that the highest bed which Wardsfork could raise with his best ploughs and teams, and the after dressing to boot, would not suffice to prevent the over-passage of the water. And the longer the hill the greater the difficulty; and we could rely on them still less where the soil was light and loose, and had previously been worn into gullies.

Most of Wardsfork's objections to the ditching system relate either to its imperfect execution or its abuse; and all may be obviated when it is used, as it has been modified in some places.

In the first place, I believe that the alleged loss of crops, by abstracting so much land from culture, even where the ditches are as wide and deep as those of Mr. Skipwith, is founded on a misapprehension. There is certainly no loss in the long-run, when compared with the old mode. It proceeds from a fallacy which unhappily has been too prevalent heretofore in Virginia. The acre which produces double the crop of another, is of more than double its value; as for these different products, the same

* See Farmer's-Register No, 7, page 407.

amount of labour is bestowed on each. But the inquiry among us too often is, not what is the relative strength of our fields? but how many corn-fields (good, bad or indifferent) is the proper crop to "pitch" for a given number of hands? And there are many who persist to this day in cultivating parts of fields, the products of which, while unmanured, will not repay the charge of tillage. This is more particularly the case in broken lands, which they are discouraged from attempting to improve. For, as Mr. Bruce says, why manure them, when the first rain may sweep it entirely away. Any expedient then, which promises to retain both soil and manure, is not lightly to be rejected, without providing a better substitute, applicable even to extreme cases.

Now I would call Wardsfork's attention to a fact which he may have often observed. Let him view from an opposite eminence the side of any rounded hill which is surmounted by a level of considerable breadth, and which, having been cleared and cultivated in the usual style for several years, is again recently ploughed. Even if no gully is presented, he will probably perceive three different shades of colour, and it is likely, as many different qualities of soil. The middle belt will be in far better heart than either that above or below it, both of which will partake of the nature and appearance of the subsoil. This I suppose to be occasioned thus. The water which falls on the flat land above, is absorbed and secretly settling towards the brow of the hill in large force, either bears off the soil on its bosom, or else *strains* it (so to speak) of is fertilizing properties, and carries them down to the middle portion. As this is a broadcast operation, *there is accumulated*, as it were, *a double layer of soil on this belt*, which now presents a barrier strong enough to be stationary itself: but the water passing over, or through it, meets with less resistance in the breadth of soil next the base of the hill, and either carries it, or its strength, to the bottom. Such is the effect of the constant action of rains for a series of years. And the proprietor of such a hill, who has contrived to prevent a breach, (perhaps by having a stiff soil on a clay substratum,) flatters himself that he has succeeded in preserving the soil itself, when in fact, a large portion of it is reduced *caput mortuum*. Now, there is little doubt here, that had graduated furrows been interposed at the several lines of stress, to arrest the water in its descent, and give it a different direction. The whole result would have been different. There can be as little that the farmer, in their adoption, would have been more than doubly compensated for the portion of land appropriated to them, by their preventive good, as well as by the assurance of greater permanence to any future improvement he might impart to the intervals. Not to mention that, the gradual deepening of the soil, *i. e.* the increase of its quantity as well as quality, is a primary

object which the cultivator should never lose sight of, and which can only be insured by some such mode.

Time was when the bedding of alluvial flats on the margins of streams was objected to on the same account, viz: that all the land occupied by the water furrows was lost to the grain crop. But even supposing that the rounded form of the beds did not repay this, the increased product, from effectual draining, more than counterbalances this partial injury. The graduated furrows, however, are used on hill sides, and when we consider the upward growth of plants, it will be found that, as in the case of garden terraces, they virtually demand much less space for themselves, than from a side view, would be supposed.

But experience has shown that it is not necessary to have them in all cases as wide or deep as those of Mr. Skipwith. Those present a needless array of means for the desired end; and if the additional labour could be conveniently spared, to dig such little *races* on the hills of Wardsfork's champagne country, would be like breaking flies on a wheel. He has but to step over to the neighbouring county of Prince Edward to find them in successful operation on a smaller scale. There, the principal part of the work is performed by ploughs; the whole of which is but little more than the best James river farmers expend in water-furrowing their lands laid down in wheat. Examples of like success elsewhere might be cited.

I object, as Wardsfork does, to the perpendicular ditch. Yet no plan proposed as yet, not even his own, prevents the partial descent of soil between the drains, in very heavy rains. It is nearly all caught, however, in the drains themselves, and may be taken out to the embankment with the hoes, after being loosened, if required, by the ploughs.

"But the carts break through them and make ruts down the hill." Really, Mr. Editor, if we are to be deterred from making any improvement by the occasional negligence of negroes and overseers, we might be forever stationary, or rather, retrograde. Carts have occasion to go on corn or wheat fields at but one season of the year, after the crop is seeded. If the proprietor has his farm roads properly disposed, I know of nothing to prevent their going directly on to each interval, and returning parallel with the furrows. Bridges are not needed; and if the carters did occasionally cross a drain, how long would it take the farmer to repair the injury, before a rain could come to make it greater?

"But lastly, it is complicated—difficult of execution." The greatest mystery connected with it is the use of the rafter level, which is common to both plans; and there is nothing very abstruse in running four furrows along a defined course with a hill side plough—the fourth to be in the track of the second—and

afterwards drawing out the loose dirt with the hoes. Nor is the whole process expensive.

One word more. I have seen the graduated furrow used with advantage on a hill side which was in wheat, and where but little more land was lost by it than if it had been a flat. It prevented the formation of small gullies before the wheat had taken sufficient root to hold the land together; and as a smooth surface for this crop on broken land is preferred to bedding, Wardsfork's chief objection to its use is thus obviated. Might not a row of peas or some other low-growing plant, which would neither prevent the passage of the plough, nor obstruct the free current of the air to the adjacent row of corn, be set on the embankment of the "trenches," and thus prevent the partial loss of crop?

I find, Mr. Editor, that I have proceeded much farther than I intended, being led on by my anxiety to have the attention of my brother farmers drawn to this matter: and if I have stopped before I have finished what I intended to say, it is in the hope that others better qualified than myself, by experience and more extended observation, will give us their views of the relative value of these suggestions. There can be but one opinion as to the importance of the device, if successful. A large portion of the cultivated land in our country is broken in its outlines—and if it can be *secured* by these means, its value must be greatly enhanced, as it may now be ploughed with ease; and it is well ascertained that a hill side will withstand a drought better than the level above it—a consideration of no small moment in this climate.

I wish Wardsfork many happy returns of the luxuriant harvests from fields which he has restored to more than their primitive fertility, with such benefit to his country, and such profit to himself. He has favoured us with his views of prevention: will he or some other of your hundred correspondents give us a dissertation on the *cure*—of gullies?

C. F. N.

Art. LXXXVIII.—*Culture of Sugar-Cane.*

[The following remarks on the "cutting down or *wind-rowing*" of the Sugar cane, we find prefixed to an extract from the Manual, on the cultivation of the Sugar-cane, in the *Louisiana Register.—Ed. So. Agr.*]

The article which we publish to day in relation to the sugar-cane in Louisiana, does not speak as strongly in favour of cutting down, or wind-rowing the cane, as the importance of the subject demands. This is doubless owing to the circumstance that at the time the Manual was compiled the custom of cutting down the cane was more a matter of experiment, than a course calculated to save millions annually to Louisiana.

The first trial of cutting the cane which we saw, was made by the late John Anderson, on the Mount Hommas estate in the parish of Ascension, in 1828-9. Soon after the vegetation was destroyed by the frost, which we think was about the middle of November, one acre of cane was put in wind-rows, throwing four rows together in the middle space, after the manner of matressing. A long side of this acre, the cane was left standing, and ground the last, of any of the cane so left; but such was its condition that sugar could not be made from it—not even molasses. On the 26th January, 1829, the acre of wind-rowed cane was ground, and in the appearance of the juice, and in every other respect, worked as kindly, and made as good sugar, and as quick, and in as great quantity per acre, as any that had been cut during the rolling or crop-gathering season. This satisfied us at once that the measure was a discovery equalled only in importance to Louisiana by the introduction of sugar-cane itself.

James McCalop, Esq. of the parish West Baton-Rouge, converted the Poplar Grove estate into a sugar farm, and gathered his first sugar crop during the winter of 1829-30. On the 18th November there was a severe frost, which froze the cane. Mr. McCalop being a new sugar planter, consulted with his sugar growing friends on the expediency of wind-rowing his cane, who all told him, if we remember correctly, that he would ruin his crop. The opinion of his sugar maker was then asked, who replied that he would not take upon himself the responsibility of recommending the measure. What, then, was to be done? Many hundred acres of cane were completely frozen, and according to all probability if it stood in the field, none of it would yield sugar at the end of three or four weeks. Persons who have established sugar estates know something of the cost attendant upon doing so. This was Mr. McCallop's first crop, and the prospect of its almost entire loss, was not calculated to increase the equanimity of his reflections. Under these circumstances, and with a knowledge of the result of the experiment made by

Mr. Anderson, he determined to put all his cane in wind-rows, following the plan of the Mount Hommas experiment, and accordingly did so, leaving standing only about three weeks grinding; at the end of which time it would make neither sugar nor molasses—not even vinegar. He then began upon the cane in wind-rows, and found it in good order, and continued making good sugar till the 9th of February—making as good sugar at that time as he had made at the commencement, or at any other time of the season. By way of testing the experiment more fully, Mr. McCallop left five or six rows of cane standing, which at a time long before he was done making sugar, was completely rotten, and entirely useless. In this case, the experiment succeeded beyond the most sanguine expectations of Mr. McCallop. We recollect hearing it stated at the time, that he made a better crop than any person on the coast. We know several persons who pursued the plan in their crops of 1830–31, and since—the number increasing every year; and we have yet to hear the first one say that the plan did not succeed well.

John Nolan, Esq. of the parish of West Baton Rouge, remarked to us a few days since, that he would not for ten thousand dollars, agree to never wind-row his cane, for that he saw no other way to save his crop when an early frost, which frequently occurs, froze his cane to the ground, almost by the time he could begin to gather it. The idea that the cane must be severely touched with the frost before it is laid down, is, Mr. Nolan thinks, fallacious, and for the following reason. Before he commenced grinding, and before cane leaves were deadened by the frost, he cut a road through the cane, which was laid in a wind-row, and ground towards the latter part of the gathering season, and was found not to be sprouted, but made as much and as good sugar as any that was laid down after the vegetation was destroyed, or after the cane was frozen.

After all this, with a knowledge of the fact that such is the variableness of our climate—a difference of sixty degrees Fahr. often occurring in the winter months, during a single week—that the cane which is one day frozen, may the next be thawed, and be on the third, good for nothing; is it not surprising that there are persons, sugar planters too, who are still sceptical on the subject of wind-rowing the sugar-cane, as soon as the leaves and upper joints are deadened by the frost?

We design, on a future occasion, to make some remarks on matressing the sugar-cane; and also upon the subject of permanent leading, and moveable lateral rail-ways, for the purpose of transporting the sugar-cane from the field to the mill.

Art. LXXXIX.—*Short Directions for Transplanting Trees.*

[FROM THE NEW-ENGLAND FARMER.]

Food is as necessary to the health and growth of plants, as it is to animals. The best food for plants is rich, pulverized earth, or rather the vegetable matter which it contains. That your trees and shrubs may live and thrive, proceed as follows: dig for your trees holes at least three feet in diameter, and eighteen inches deep, and for shrubs a proportionate size and depth, throwing away the lower spit of earth. Then fill up the hole to a proper height for setting the tree, with rich surface earth, or perfectly rotted manure, blended with four out of five parts of earth. Set your tree and cover with surface soil, treading down when the roots are covered with earth. See that the roots are trimmed of all bruised and broken parts; that they are separately extended in their natural direction; that fine earth every where comes in contact with them. A potato or two, or a gill of flaxseed or oats, may be advantageously placed in the hole before the tree is set, and a pail of water turned in after the hole is two-thirds filled. The rich earth affords nutritive pasture for the young root to range in; the potatoes, &c. keep the ground loose and moist, and enable them to roam freely, and the water brings the earth in contact with the roots, and prevents them from becoming mouldy. Keep the ground free of grass as far as the roots extend; for these exhaust the moisture and nutriment necessary to the plant, and exclude from the roots air and heat, the indispensable agents to vigorous growth. Treat your trees as you would favourite corn-hills, which you wish to make the most of, except give them no unrotted dung. Washing with a strong ley in May will destroy insects and promote the health and vigour of your trees. To persons living remote or who are unable to obtain their trees for early spring planting, we recommend that they procure them in the autumn and *lay them in by the heel*, as nurserymen technically term it; which is merely to dig a trench on a dry piece of ground, laying the earth on one side—the trench wide enough to contain the roots; put the roots into this, close together, letting the stocks rest in an inclined position upon the bank of earth and then cover the roots and a part of the stocks with earth. In this way they escape injury from the frost of winter, and are in readiness for early planting in the spring. Besides, better plants are generally obtained in the autumn than in the spring after nurseries have been culled.

Art. XC.—*American Grapes; by* W. W. B.

[FROM THE GENESEE FARMER.]

"Hammond's Port, December 24.

As a very considerable variety of American grapes have of late been collected and brought into notice, possessing different degrees of merit, it is very desirable for the satisfaction of those who may wish to select for their own cultivation, that their respective merits should be made known. Of a number of the best kinds, this has already been done; and some of them have already come into such general cultivation, that they are well known; as the Isabella, Catawba, Bland, &c. The writer's knowledge of American grapes extends to but few varieties. There is one, however, to whose excellencies he can bear testimony, but little known in this part of the State, but which has received a very favourable notice from the younger Mr. Prince in a communication in the fourth number of the second volume of the *Genesee Farmer*. Until I saw that communication, I supposed the grape a foreign one, for I obtained it as such at a vineyard between Troy and Lansingburg, commposed entirely of this grape. It there went by the name of the Black Hamburg; and from the excellency of the fruit, its entire freedom from any foxy flavour, I supposed it was a foreign grape. The characteristic appearance, however of the leaf and wood, which marks all our native varieties, shows it to be an American grape. Mr. Prince says, it "appears to him to approach the Isabella more nearly than any other variety that has met his notice." It, however, differs from it in several respects. The fruit is oval like the Isabella, rather larger I should think, a dark purple or black, with little or no pulp when thoroughly ripe, juice rich and sweet, with none of the peculiarly musky flavour of the Isabella, which to some is unpleasant, ripens about the same time with the Isabella, is an abundant bearer, and on the whole a *very valuable grape*. What are its qualities for wine I know not, though I should think fully equal if not superior to the Alexander. Mr. Prince calls it the *Troy grape*, and advertises it under this name in his catalogue. We should be glad to know something of its origin, how or by whom introduced into cultivation about Troy.

An amateur of the grape, a Mr. Gay, of the Seneca Falls, informed me this fall, that he had a grape growing in his garden which he valued very highly, a *native of Western New-York*, which, from the location where he found it growing in its original wildness, he has named the "Island grape." If I recollect distinctly, he said he found it growing on an island at or near the junction of the Clyde with the Seneca river. He described

it as a white grape, similar to the Sweet Water in size and appearance, of a fine flavour. From his description, I inferred it was not the common white fox grape. I am not aware that the white fox grape grows wild in the western part of our State. Mr. Gay would confer a favour upon the public, by giving in the Genesee Farmer a particular history and description of this grape; whether he considers it the same as the New-England white fox grape; its comparative merits with other well known grapes; time of ripening, &c. Especially as it is the product of our own part of the State, this description would be the more interesting.

W. W. B.

P. S. In a recent communication I have received from Mr. Prince, in answer to one in which inquiries were made relative to the Susquehanna grape, he says: "The whole tale about the Susquehanna grape is an *infamous humbug*. There is nothing palliative or explanatory that is based on real facts. We know so well the characters of foreign and native vines, that we would put life almost on the decision."

W. W. B.

Art. XCI.—*On Bees; by* Ulmus.

[from the genesee farmer.]

When remarking last in the *Genesee Farmer* on the cultivation of bees, I promised to give the future results of my experience on this amusing and pleasant branch of domestic economy. I am, therefore, most happy to say that all my experiments, three in number, have succeeded fully to my expectations.

Early last spring, I located a swarm in the peak of a very high four story brick store in Buffalo, near the harbour, close by the vessels and steamboats, and directly facing the lake, in a most exposed and windy situation. The hive which contained the bees, was set over a large and long new one with several apartments, which I intended they should gradually fill, if the experiment succeeded to my wishes. The hive was lively, but small; and from the wind blowing immediately off the lake, and often with some severity, there was much of the time they could not work; added to this, they were upwards of fifty feet from the

ground, and hardly a tree, shrub, or flower, for nearly half a mile's distance. Indeed, I anticipated a total failure, and from their weakened condition at the commencement, supposed at best they could only live through the season; and a short time ago I fully determined to remove them, if any remained, into my garden under a good bee-house, and replace them over the same hive, it being fifteen feet long, with five separate partitions, yet all connected by openings, so as to allow access from one to the other. Each apartment has a drop floor connected to the front, or projecting part of the floor by butts, and held up by hooks. This I hang up by chains in the bee house, and is built on the Charlieshope plan described in the third volume of the Genesee Farmer, page 7. The reason why I changed their location was, that I was assured from their exposed and windy situation, they could not labour with half the ease and security that they could in a better sheltered location, and I wished a more convenient position to inspect their operations.

As I observed, therefore, I expected to find them barely alive, not having examined them for months; but on letting down the floor of the large new hive, I found the apartment, a space of three feet long, one foot high, and fifteen inches wide, more than half filled with beautiful white fresh comb, and the bees buzzing among it most merily. I then raised up the original hive above it, and found it exceedingly heavy, and full to cramming of bees, as lively and finely conditioned as I ever saw them. I carefully removed and carried it to my house and set them in the cellar, and intend as soon as spring opens to set them on the large hive removed into the bee-house in the garden, where I hope often to be cheered by their busy murmur through the long days of summer.

This experiment, although not continued for the reasons mentioned, proves most fully that those useful little insects will thrive amid great disadvantages, and at a great height from the earth. Indeed I have little doubt but in a *well sheltered* position, they will succeed admirably in high brick, stone, or wooden buildings, and at a distance from their food. May they not be even healthier in such a high atmosphere? The bee-moth, of which I observed indications when placing the hive, did them no injury. I estimate the swarm to have at least trebled in numbers; and besides filling down the main hive, to have built at least 50lbs. of new comb in the large one.

Another hive which I have in the garret of a brick building in the compact part of the city, has gone on and flourished to my full satisfaction. They have made the past season upwards of 100lbs. of honey and comb, and have increased to most formidable dimensions, there being as near as I can ascertain, upwards of a bushel of bees alone. This hive has been at work two summers, and to my knowledge, has never swarmed.

They appear very contented, and having as yet plenty of room, have no desire to emigrate. The moth, although occasionally seen around the hive, has not molested them. I now consider this hive in successful operation. It is the first described swarm in page 5 of third volume of Genesee Farmer. I last fall removed the old hive from the top of the long one. It was very full and heavy, and the bees had all left it and gone down to the large hive below.

My next experiment, being the second described in page 5, as above, it will be recollected was only partially filled the year before last. About a bushel and a half of space in the hive remained to be filled. That they finished in good season, besides making up a good box of fine white comb attached to the side during the summer. These, also, have not swarmed to my knowledge, although evidently pressed during the latter part of summer for room. This hive was in my garret and not dark, the bees having a passage out of a boarded window on a smooth board above eighteen inches from the hive. The bee-moths were plenty around it, but being well watched, did little damage. Owing to the want of room in this box, holding about two and a half bushels, and the great size of the swarm, I have partitioned off a small dark room in one corner of the garret, from which I have issued a tunnel like that described by W. W. B., in his ingenious and excellent essay, page 84, third volume Genesee Farmer; only my tunnel is one foot wide, one foot long, and one inch depth of space inside the room, and tapering to near a quarter of an inch at the outter end, the more effectually to exclude the moth. I have adopted the house plan in this instance, because it affords the bees more room to labour with less trouble, and I am inclined to test the extent to which a swarm may be increased. If they go on and build their comb to the rafters and slats which I have prepared for them, it can be easily obtained when wanted, and sufficient left for the uses of the hive. I have set the hive in such a position that they can run easily from it on a smooth board to the spout leading out, and I anticipate a great summer's work out of them. Whenever it needs ventilating in the summer, I have only to open the windows and scuttle of the garret, and set open the door of the bee room at night, and all the fresh air can be admitted that is needed. But they want little fresh air. Heat and darkness are their choice, and if the air be pure around their habitation, it is all they want.

I saw an instance at a neighbour's apiary last summer, where a bee house was so prepared that the whole colony left the hive and went up into a corner of the room, and built large masses of comb on the wall. I have not taken much pains to make my bee room very warm, having it perfectly tight and secure. The influence of the sun is advantageous to them in summer, and

they will be as warm in the winter as is necessary; quite as much so as in ordinary hives, and they always cluster together among the thick masses of comb, so that little danger need be apprehended from the cold.

I should be exceedingly pleased to hear from W. W. B. the result of his experiments with his bees. His rural occupations and the occasional leisure allowed him from his professional engagements, have, I hope, led him into a more minute observation of the natural history and character of this interesting part of Entomology, than the increasing cares of business of the past year has allowed me to do. In fact, what little time I have spent with my bees has been mostly by snatches, and altogether unsuited to deliberate examination.

I do not know that I have any new suggestions to make on the subject of bees, other than those submitted in the third volame of this work. The more simple their management the better. At any rate, no one need suppose his bees will thrive without attention, although they require but little actual time and labour.

ULMUS.

ART. XCII.—*Importance of selecting the best breed of Live Stock, particularly of Swine; by* D.

[FROM THE NEW-YORK FARMER.]

" New-Haven, January 20, 1833.

Mr. Editor,—I have noticed frequently and with pleasure, your remarks in regard to the importance of a careful selection of the various sorts of live stock raised in our country. If farmers were more particular to select the best breed of all the animals they raise, undoubtedly they would find it much to their advantage. There is, perhaps, in our country, no animal in which there is greater neglect than in swine; and it becomes every man who fattens a single hog, to look to it that he gets one of the right sort. And if this is the case in regard to the man that has but one, how important is it for farmers throughout our country, that they raise only from the best and most approved breeds. It has been thoroughly proved by several persons in this region, during the last two years, that the advantages in the improved breed is greater than was before imagined.

Trials have been made between hogs of the common sort called good, and a breed introduced into this neighbourhood by Mr. W. K. Townsend. They were imported from England three years ago, and are called by him the *Norfolk thin rind breed.* They are small bone, thin rind, the meat very fine grained, remarkably thrifty, and inclined to fatten early, or will continue to thrive until eighteen months old. It is not uncommon for all pigs kept over the season the next fall, to weigh from435 to 460lbs. and for spring pigs butchered in the fall to go over 300lbs., and this with ordinary feed. One of my neighbours who three years since, tried hard to get two pigs of the old breed to weigh in the fall 200lbs. each, has the last season, with, he says, no more care, or no better feed, made two of this breed weigh 660lbs. He considers that he has gained at least 100lbs. of pork on each hog, by the change of breed. These pigs weighed the 1st of April 24lbs. each. A farmer, a few miles in the country, butchered two at 13½ months old, that weighed rising 440lbs. each, and he says he gave them the same care as he always had given his hogs; he asserts that he has gained fully 200lbs of better pork than he generally had, which he says he credits to the breed. An old Revolutionary pensioner purchased one of this breed from Mr. Townsend's farm in the fall of 1831, then a sucking pig, weighing about 35lbs.; and as he had made one from the same pen, just butchered, weigh rising 400lbs. he declared that he meant by the next fall, to make this weigh 500lbs. The hog was butchered, say the last of December, and the old soldier has gained one pound over his mark. These facts are stated to induce others to try the experiment of selecting their pigs from the best breeds. I am convinced myself of the importance of it, and wish others, and especially farmers, to practice on this principle.

D.

Art. XCIII.—*Swine.*

[FROM THE NEW-ENGLAND FARMER.]

The following observations respecting this ugly uncouth, but useful animal, are mostly condensed from a number of authors on both sides the Atlantic.

It is best to begin to fatten hogs the latter part of August or beginning of September, so that they may be fit for the butcher

before the weather becomes very cold, as it is very difficult to put flesh on them in cold weather.

When you commence fattening swine, care should be used not to give them more than they will eat with appetite. If they become cloyed their thriving is retarded, and there is danger from staggers and other diseases. Their troughs should be often replenished with a small quantity of food at a time, and kept always clean and well seasoned with salt.

An English farmer fattened eight pigs in the following manner, which may be recommended in cases where a constant and regular attention cannot be given to feeding the animals. He placed two troughs in the stye: one he filled with raw potatoes, the other with peas, and gave no water. When the pigs were thirsty they ate the potatoes. In this way, it is probable that the animal would not only thrive without water, but needed no antimony, brimstone, nor other medical substances; for raw potatoes, being cooling and loosening, might serve at once for food and for physic. Instead of peas, perhaps dry Indian corn, for what would be better Indian meal, might be substituted. This mode of management with swine was first recommended in the New-England Farmer of August 6, 1824, and we are glad to find that it has been adopted by a writer for the Northern Farmer.

Cunningham, in his *Two years in New South Wales*, relates—"I had often heard it said among sailors that pigs would fatten on coals, and although I had observed them very fond of munching up the coals and cinders that came in their way, still I conceived they might relish them more as a condiment or medicine than as food, till I was assused by a worthy friend of mine, long in command of a ship, that he once know of a pig's being lost for several weeks in a vessel he commanded, and it was at last found to have tumbled into the coal-hole, and there lived all that period without a single morsel of any thing to feed on but coals: on being dragged out it was found as plump and fat as if it had been feasting on the most nutricious food. Another friend told me of a similar case, which came under his observation; and although these may be solitary instances, yet they serve at least to show the wonderful facility which the stomachs of certain animals possess of adapting their digestive powers to such an extraordinary species of food, and extracting wholesome nourishment therefrom. When we consider coal, however, to be a vegetable production, containing the constituent principles of fat, carbon, hydrogen and oxygen, our surprize ceases.

I always cause as many peas as I want for feeding my hogs, which are not a few in a year, to be regularly malted in the same manner, nearly, as my barley; this management has succeeded very well with me.

I have frequently given them to my horses, with which they agree very well, and are a heartening food.—*Museum Rusticum*, v. *p.* 110.

Young pigs require *warm* meat to make them *grow*. Corn and cold water will make them sleek and healthy; but warm beverage is considered requisite to a quick growth.—*Marshal's Inland Counties.*

Every stye should have a rubbing post. Having occasion to shift two hogs out of a stye without one, into another with a post, accidentally put up to support the roof I had a full opportunity of observing its use. The animals when they went in were dirty, with broken ragged coats, and with dull heavy countenances. In a few days they cleared away their coats, cleaned their skins, and became sleeky haired: *the enjoyment of the post* was discernable even in their looks; in their liveliness and apparent contentment.—*Ibid.*

From experience I have found that swine prefer lucerne to clover. I have experienced that neither lucerne or clover of themselves are sufficient support for swine. A small quantity of corn, peas or beans, is certainly necessary to be given them.

I have applied potatoes in different modes for feeding swine; giving them whole or mashed in the water wherein they were boiled; or in the last mode, with barley meal scalded and mixed in the trough. But from various and repeated experiments I have found the following the most profitable method of applying potatoes, not only to the rearing, but likewise to the fattening of hogs; varying the quantity given according to the circumstances of rearing and fattening.

When rearing, a small quantity of food given once or twice a day, with lucerne, clover, grass and offals, is sufficient.

When fattening, a constant supply is essentially necessary, so as not to leave the troughs encumbered with stale food, which should be cleared out, and given to store swine.

An iron kettle is the most salutary for boiling potatoes.—Should time or convenience not permit to have it emptied for several days, no bad consequence can ensue. Copper, or copper and lead, are extremely dangerous, as they generate poison; therefore they should be immediately emptied and cleaned.

The method I have always adopted and always shall pursue until a better is pointed out, is, to fill about three parts of a large kettle with potatoes: I scatter over them about a peck and a half of barley meal [or Indian meal,] then fill the kettle with potatoes, adding just as much water as will cover them. Then the meal does not sink to the bottom of the kettle where it will encrust and burn, nor will it be liable to be wasted by boiling over. The nourishment of the meal is in a great degree extracted by the water. After the potatoes are well boiled, let the

whole be mixed and bruised in tubs, with a clean spade, so as to form a pulp. By this method, all the nutritive powers of the meal and potatoes are incorporated, and thereby much easier digested, and the hogs require no water.

In cold weather it should be given blood warm. The swine while fattening should be kept as clean as possible, and well supplied with dry litter. Twice or thrice a week add about three table spoons full of salt to each half bushel of their food, which assists digestion and promotes appetite. When too much salt is given it acts as a purgative, which prevents the deriving of due nourishment from food.

About once a week I have mixed two table spoons full of madder, which prevents obstruction, acting as a diuretic and astringent. On some other day in the week, I give a spoonful or two of an equal quantity of flour of sulphur and saltpetre, well pounded and mixed, which purifies and cools the blood. These articles added to the food and given on separate days, intirely prevent measles, keep swine healthy, and cause them to fatten expeditiously.

Hogs from the age of twelve to eighteen months are the most advantageously fed for fattening, as they have attained their full growth, will require less food, and fatten more expeditiously than hogs which are younger.

Food which has been rendered acid by fermentation has been frequently recommended in preference to that which is sweet for feeding swine, and we have been told by farmers who have practised the method that it is very beneficial. In order to effect the very desirable degree of fermentation the following process may be adopted.

Steam or boil potatoes, mash them, and mix with the liquor, while scalding hot, oats, Indian meal, pea meal, or the meal of any other kind of grain. Have ready several tubs or other vessels to receive this wash, and when it is fermentated *to the proper degree* give it to the animals. It should not stand till it has become very sour; and if the putrid fermentation has commenced it is nearly ruined.

The following mode of procuring acidulated food for swine is pointed out by the celebrated Arthur Young. "Grind the grain to meal, and mix it with water in cisterns made for that purpose, in the proportion of five bushels of meal in a hundred gallons of water; the mas to be well stirred several times each day, till it has fermented and become slightly acid, when it will be ready for use. In this way two or three cisterns must be kept for fermentation in succession; and the profit will more than pay the expense."

Art. XCIV.—*Bots.*

[FROM THE GENESEE FARMER.]

Much difference of opinion prevails among farmers, as to the cause of bots, the manner in which they destroy horses, and the best method of protecting them against their attacks.

The bots which cause the death of so many horses, are hatched from the egg of a bee or insect, which belongs to the Class *Insecta*, Order *Diptera*, Genus *Cestrus*. It is affirmed by entomologists that there are two species of the genus Cestrus, which deposit their eggs upon horses, but which of the species it is, that produces bots, or whether both of them do or not, they are not agreed.

The eggs which produce bots are deposited during the months of August and September, but how they are conveyed to the stomach is also unsettled.

This insect, like others of the same class, passes through different stages. Commencing with the egg, which hatches into a larvæ, which remains in the stomach through the winter, where it continues to increase in size, until the warm weather in the spring, when it passes off with the *fœces*, and changes from its larvæ state, to that of the perfect fly, or bee.

It is during the last winter or fore part of the spring that these larvæ do the greatest injury, to the internal coats of the horses' stomach.

From examinations made on the stomachs of horses which have been destroyed by bots, it appears that the larvæ, attach themselves to the stomach, when small, by their antennæ, or horns, where they continue to increare in size, as the season progresses, drawing their nourishment from the juices of the stomach. As the season approaches, for their transmutation or transformation from the larvæ, to the fly, they become stupid and let go their hold upon the stomach, and pass off with the remains of the animal's food, and from thence into the ground from whence they emerge perfect insects.

When the number of these larvæ, is not great, and the food, and exercise of the horse is steady, they do not often affect him, but where the number is great, and the horse is fed irregularly during the last of winter they often prove fatal.

The season when horses are destroyed by bots, in this latitude, is from the middle of February, to the middle of May. The remaining nine month in each year there is little danger to be apprehended from them.

Numerous experiments have been made, by immersing them in different substances, after they have been taken from the stomachs of horses, in order to find something which would des-

troy them, by being given as a medicine, very few of which has ever given any encouragement of success.

During the time that this insect is in its larvæ state, it is covered with a thick, tough skin, which seems to protect it against the effect of any substance, which can be introduced into the horses' stomach with safety.

As it is next to impossible to destroy bots in horses, the greatest safety is making use of such preventives as are found most beneficial.

The first step towards preventing bots, undoubtedly, is, to keep the horses legs, and sides as clear as possible from the nits or eggs of the insect, by scraping them daily with a sharp knife. By doing this the quantity is supposed to be materially diminished.

The next precaution is to keep horses moderately loose, in their bodies, and not to make sudden alterations in their food, nor to treat them in any manner that would have a tendency to render them inclined to fever.

The articles most recommended to be mixed with their food are lime or ashes, either of which if given in small quantities, during the three months when they are troublesome, are said to be efficacious. Salt is also highly recommended by some who suppose that if a horse is salted once or twice each week it will prevent their being troubled.

The manner in which bots operate, is by destroying so much of the inner coat of the stomach as to produce inflammation, or by collecting either at the upper, or lower end of the stomach and obstructing the common passage of the bowels; cathartics are to be recommended.

A late English writer on the diseases of horses says, "when bots fix themselves on the sensible portion of the stomach they may do harm; *but that no medicine we know of will destroy them.*" Another English writer on this subject, says that bots are generally attached to the insensible part of the stomach, and that while remaining there they promote health rather than injure it. Blaine, as well as most American writers, recommends common salt, as one of the best preventives against inflammation from bots, and says it should be given daily.

Treating the disease by bots, as an inflammatory complaint, undoubtedly is the course most beneficial, and will come under the same management as other inflammations of the bowels. The same causes that produce ordinary inflammations of the bowels, are also liable to produce inflammation from bots, and these are, over exertion after which the horse is allowed to stand exposed to cold; poison substances mixed with food; but the most fruitful cause is, the change of food. Perhaps there are more cases of inflammation produced by this last cause than all others.

Whatever is used as carthatic, in cases of inflammation, caused by this larvæ in horses, they should always be accompanied with gruel, boiled starch, flax-seed tea, or something of the kind to prevent irritation; and the animal treated in every respect as for an inflammation of the bowels, without any regard to its being caused by bots, and no medicine should be given in the one case which would not be proper in the other. The whole course to be pursued may be summed up in a few words; first bleed, give physic, follow it with mucilagenous drinks, keep the animal warm, and if he recovers, feed moderately for several days.

Art. XCV.—*Excretory Powers of Plants*; *by* B.

It has been lately discovered by a vegetable physiologist on the continent, that plants actually exude excrementitious matter from their roots. Plants put to grow in water impregnated with a certain chemical quality, absorbed a certain portion of it, and on being removed into another vessel of pure rain water, discharged into the latter liquid the quality absorbed in the first. In order that no portion of the impregnated water might be carried upon its exterior, the plant was carefully washed in distilled waters previous to its emersion in the rain water. The experiment showed to a certainty, that the plant had taken into its vessels a chimical body in solution, which it afterwards emitted. On the strength of this proof of the power of plants to give out what they before had taken up, a new theory has been founded, importing that in this respect they resemble animals, taking in food by one set of organs, and after appropriating to themselves by assimilation such parts of it as may be suitable for their sustenance, disgorge the refuse by the same or some other organs, into the earth. The necessity of a rotation of crops is accounted for on this hypothesis—the plants discharging their fœces into the earth contaminate it and render it unfit for the support of plants of the same kind following on the same spot.—*Hort. Reg.*

Remark.—The inference deduced above, and by Professor Lindley, that the exuded matter becomes a poison in the soil to a crop like that which gave it off, is manifestly incorrect; otherwise two crops of wheat or other grain would not grow in succession on the same field—a fact which is disproved by the experience of almost every farmer in the Genesee. The utility of a rotation can be explained on a different and more rational

principle—the exhaustion in ordinary soils, of the particular food of a crop in a season. The great secondary formation of the West so abounds in the specific food of wheat, that a succession of these crops does not exhaust, though it must sensibly diminish it. In general, grounds will not bear two successive crops of wheat without great deterioration. Flax particularly exhausts the specific food adapted to its wants, and is not grown a second time on the same field, in Holland and the Netherlands, except at intervals of 8 or 10 years. B.

PART III.

MISCELLANEOUS INTELLIGENCE.

Rice Wine—Mr. Editor—I observe in some accounts of the old travellers in India, mention made of Rice wine—a fermented liquor, obtained from that grain, and an infusion of spices. It is spoken of as wholesome and very pleasant. Of course it cannot be Arrac, for that is a distillation. Can any of your correspondents inform your readers, of the method used for preparing this wine. It is of importance to know every mode of using this staple production of our country. A.

Notices.—The early histories of this country mention that acorns were used by the Indians of Florida for making bread; the Cherokees used the chesnut pounded and mixed with corn meal.

The Oil of Butter Nut Walnut, bearing black nuts. It is said its bark is a safe and excellent carthatic: Winterbotham's America, vol. iii. p. 379.—And Ferdinand de Soto, in his voyage, 1540, saw the Oil of the nut made into buter.

It is also said the bark of the white willow has the properties of the Peruvian Bark.

The Cotton spun in Great-Britain in 1832, amounted to about 288,000,000 lbs., of this quantity, one-tenth was spun in Scotland. The United States supply three-fourths of this consuption, or 213,000,000lbs., the East-Indies 20,000,000, and the West-Indies 1,600, 000lbs.—*Quar. Jour. Agr.*

The Imports of raw Cotton manufactured in Great-Britain in 1781, were only 5,000,000lbs. In 1800, they had increased to 86,000,000lbs. In 1820, to 147,000,000. In 1830, to 250,000,000. The annual value is not less than £36,000,000. The wages paid 22,000,000 pounds sterling; and it keeps

in employ 1,250,000 persons, or 25 times as many persons as were engaged in it 50 years ago. In Manchester alone, 187,000 persons are engaged in the cotton trade.—*New Monthly Mag.*

England and Wales feeds 36,000,000 of sheep; each of which yield a fleece of 4lbs. or 144,000,000lbs. which at one shilling per lb. is worth £7,400,000. These manufactured, produced £20,000,000, leaving a profit of £12,000,000 per annum to the various manufacturers of that country.—*Ibid.*

Plants.—The number of plants which have been described, are 50,000, and plants of the vegetable species on the surface of the earth, are not estimated under 100,000.—*Quar. Jour. Agr.*

The Potato.—The *Tropoleum Esculentum* and the *Chenopodeum guinoa*, the Mexicans and Peruvians preserve for a number of years by destroying their powers of germination, by exposure to frosts, and afterwards drying them, a practice which Humboldt thinks might be followed with advantage in Europe. He recommends obtaining the seeds of the potato cultivated at Quito and Santa Fee, which are a foot in diameter, and superior in quality to those in the old Continent.—*Humboldt's Travels in America.*

Have you planted a Vine!—If you have planted one that produces good fruit, take care of it and propagate it by cutting and layers, and, its fruit will richly repay your labour. If you have not, buy or beg one, and plant in the present spring. If you buy, it will cost you two or three shillings; if you beg one, I don't know how much it will cost to requite the favour. The second year after planting it will produce you fruit which will every year increase as the plant enlarges. The fruit will be found to be wholesome and grateful, and you will realize the pleasure of *sitting under your own vine* during the intense heat of summer; and you will wonder that you will have lived so long without enjoying this pleasure. The native kinds most worthy of cultivation, are the Isabella, Winne and Catawba, all hardy, thrifty and abundant bearers, and their fruit ripening in the order in which they are named. If you want foreign fruit, the sweetwater, chasselas, black cluster, other early kinds are to be preferred. These demand more care than the native kinds, and the vines will require a slight covering of earth during the winter. A little experience will make you familiar with their management, and convert the labour required for their care into a recreation.—*Cultivator.*

Best time for Cutting Timber.—The best time for cutting timber involves an inquiry of deep interest to farmers. Last summer we received the following notice of this subject in a letter from a valued correspondent:

"Some years ago, a German on the Tohickon, cut hoop-poles late in the spring, and a bundle was accidentally left in the woods lying on the ground. It remained there a year or two before it was discovered, and then to his surprise found to be untouched by the worms. The poles were ash, hickory and maple. He has since had his timber for rails and other purposes, cut at that season of the year, and I have also succesfully tried the experiment."

We did not clearly understand at the time whether the hoop-poles were preserved by *lying on the ground*, or by *being cut at that season;* and we wrote for an explanation. This we have just received, and are pleased to lay it before our readers:

"The hoop poles left in the woods were preserved from becoming *doated* or worm eaten, in consequence of having been cut *late in the spring*, at the period when the sap is elaborated in the full grown leaf. A sawyer told me that logs cut when the bark first begins to peel will soon become *sap rotten*, while others cut only a few weeks later, will remain sound in similar situations. Ash, hickory, and maple, when cut at the wrong time, are very liable to be worm-eaten."—*Gen. Far.*

Care of Horses.—An old English writer says that the groom, or man who has care of horses, should not demean himself in so kind and gentle a manner towards horses as to engage them to love him; for a horse is reckoned one of the most loving creatures to man of all other brutes, and in every respect the most obedient.

Therefore if he be dealt with mildly and gently, his kindness will be reciprocal; but if the groom or keeper be harsh and choleric, he will put the horse out of patience, and make him become rebellious, and occasion his biting and striking

Therefore the groom should frequently dally, toy and play with the horses under his care, talking to them, and giving them good words, leading them out into the sunshine, there run and show them all the diversion he can.

He must also duly currycomb and dress him, wipe away the dust, pick and clean him, feed and cherish him, and constantly employ himself in doing something about him, as looking to his heels, taking up his feet, rubbing upon the soles.

Nay, he ought to keep him so well dressed that he can almost see his own face upon his coat; he must likewise keep his feet stopped and anointed daily, his heels free from scratches, and other defects, ever having a watchful eye over him: and overlooking all his actions, as feeding and drinking, that no inward infirmity may seize upon him, without his being able to discover, and endeavouring to cure the complaint.

The next thing requisite to a groom is neatness as to keeping the stable clean swept and in order; saddles, housing-cloths, stirrups, leathers and girths clean, and above all, his horse clean dressed and well rubbed.

Lastly, diligence is requisite in a daily discharge of his duty, and observing any the smallest operation, whether casual or accidental, either in his countenance, as symptoms of sickness; or in his limbs and gait, as lameness: or in his appetite, as forsaking his meat; and immediately on any such discovery to seek out a remedy.

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Chopped Food.—A writer in the New-England Farmer, on the subject of chopping food for stock, whose stock consists of eight horses, six oxen, thirty-five cows, and two yearlings, states his saving, by chopping his food, to be two dollars and eighty-six cents. He states the expeuse of feeding his stock, in the usual way, at ten dollars and twenty-five cents a day, the expense of feeding with chopped food, seven dollars aud thirty-nine cents, leaving the balance above stated in favour of chopped food.

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Sounds made by Insects.—No insects have the power of producing sound by the mouth; they do not breathe through the mouth, and consequently have no power of producing sounds by that organ. The sounds are produced either by the quick vibration of the wings, or by beating on their own bodies, or other hard substances, with their mandibles, or their feet. The sound of the bee is produced by the vibration of its wings in the air. The cricket, when it is disposed to be merry, beats time with its mandibles against its head and horny sides in the same manner as a human being, when in good spirits or idle, drums with his fingers on the table. There is a sound which has often struck terror into the souls of the superstitious, and which is frequently heard behind the ceiling, called the death watch. This has been ascertained to be caused by a small species of wood-beetle, and most probably in the same way as the cricket produces its sound, by beating with its feet on the wood.

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Orchards around Farm Houses.—It is expedient that every farm should have some portion of orchard ground attached to it. The most convenient and guarded situation for it is immediately behind the house, so that the back kitchen door may open into it. It matters not whether it be on the north or any other side of the building. Many think that an orchard should be in a

low sheltered spot, but this is a serious mistake. Fruit trees succeed best on a moderate high and open situation. Shelter from wind is certainly necessary, but this protection must be obtained otherwise than by planting in a dell. A deep mellow loam is most suitable for an orchard. It does not require to be richly manured, provided it is fresh, unexhausted, and sufficiently dry. Whether the subsoil be gravel or stone, provided such beds be not too near the surface, it will be no detriment to the trees; but if of a tenacious clay which is retentive of moisture, then draining must be resorted to, in order to free the soil from a superfluous moisture. This must be done effectually, otherwise it will ever be a sudject of regret to the planter. A sloping surface is better for all plants than a dead level, not because a heavy or long continued rain or melted snow runs off the sooner, but because that portion of it which sinks into the ground gradually passes downward in an under current, leaving no portion to stagnate in any one place, and to become prejudicial to the roots. The most profitable kind of orchard is that which contains all kinds of hardy fruit trees and bushes, and where the land is solely appropriated to that purpose. This kind resembles gardening more than farming, and is therefore unsuitable to large farms, but quite applicable to small ones, to which an acre of orchard, requiring no horse labour, would be of essential benefit. In such orchards, half standard apples are planted in rows eighteen feet from each other, the trees being twelve feet apart. In the same line with the apple trees are planted either gooseberries or current bushes, or what sometimes pay equally well, filberts. The latter are not allowed to rise higher than about four feet, and are kept spurred in, exactly like the white currents. Gooseberries gathered green for tarts pay the farmer better than when ripe, and are not nearly so troublesome in the carriage to market. As such an orchard is not to be grazed, two feet of the soil on each side of the rows is kept bare, and always free from weeds. On this a quantity of rotten dung may be laid every winter, and raked off in the spring, upon the intermediate strips of ground to be planted with potatoes, or sown with onions, turnips, scarlet runners, or any other crop which the cultivator can most advantageously dispose of in his neighbourhood. The earliest and surest bearing apples should be preferred. A few of the earliest pears may be mixed, as the petit Muscat. The most hardy and profitable kind of plum for a farm orchard is the common damson, it being always in request for baking, preserving, or for wine making.—*Jour. Agr.*

Vinegar in Cream.—Sir: The difficulty and labour frequently attending the churning of butter, led me to try a variety of experiments to ascertain if a method could be discovered for making butter come quicker than the usual mode. After trying several things, I found that by adding a tablespoon full of good vinegar to four gallons of cream, when put into the churn, I obtained butter in from seven to eight minutes. If this information will be of any service to your subscribers, you are at liberty to publish it.—*Far. & Mech.*

To Preserve Books.—A few drops of any perfumed oil will secure libraries from the consuming effects of mould and damp. Russian leather, which is perfumed with the tar of the birch tree, never moulders; and merchants suffer large bales of this leather to remain in the London docks, knowing that it cannot sustain any injury from damp. The manner of preserving books with perfumed oil was known to the ancients. The Romans used oil of cedar to preserve valuable MSS. Hence the expression used by Horace. "*Digna cedra,*" meaning any work worthy of being anointed with cedar oil, or, in other words, worthy of being preserved and remembered.—*Greenf. Gaz.*